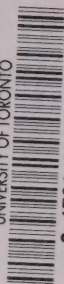


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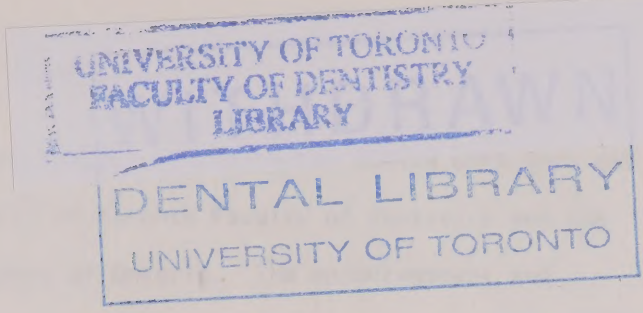
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ONTARIO DENTAL HYGIENISTS

SURVEY - 1974

by

S. C. Magid, S. B. Gilbert
and D. W. Lewis

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This survey was conducted by
The Dental Health Care Services and Epidemiology Research Unit
in co-operation with
The Royal College of Dental Surgeons of Ontario

March, 1976

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This survey was a joint project of the Dental Health Care Services Research Unit of the University of Toronto Faculty of Dentistry and the Royal College of Dental Surgeons of Ontario. The encouragement and excellent co-operation of the College is gratefully acknowledged.

The Ontario, Canadian and other provincial Dental Hygienists' Associations and the Secretary of the University of Toronto Faculty of Dentistry were most helpful in providing current addresses for dental hygienists who were not licenced in Ontario at the time the survey was undertaken. Credit for the high response rate must be shared with the many individuals from these organizations and others who gave their time and effort to help make the survey a success. Special thanks goes to the hygienists who participated in the survey.

A tremendous amount of work over an 18-month period was involved in the development and distribution of the questionnaire, and the data processing, analysis, write-up and typing for this survey report. Sharon Gilbert was the driving force in most of these phases of activity during the study's first 12 months and her initial organization and dedication to this work set the standard for those who followed her. Irma Hussey also contributed to the study during this period. Simmie Magid conducted the analysis of the data and wrote the final report. Henzel Jupiter, the project's computer consultant, had to develop a number of complex programs to produce the information contained in this report. Betty Conroy, the Unit secretary, typed the report with its many tables. To all these people and especially the participating dental hygienists, our thanks is extended.

D. W. Lewis
Dental Health Care Services
Research Unit
March 31, 1976

SUMMARY

A survey was conducted to obtain information on the working careers of Ontario dental hygienists. Completed questionnaires were obtained from 678 (88%) of the 771 dental hygienists who had ever graduated and/or registered to practise in the province. The employment history of each respondent was traced from the month following her graduation until December 1974.

All but five of the respondents were women. The mean age of hygienists who participated in the survey was 28; only 29 respondents were 40 years of age or more. Three-quarters of the respondents were married. Of the 153 single respondents, 96 were under 25 years of age.

The survey sample included 564 Ontario graduates and 114 other graduates. (The youthfulness of the sample can be primarily attributed to the fact that the first class of dental hygienists in Ontario did not graduate until 1953.)

At the time of the survey, 561 of the respondents were residing in Ontario and 117 were residing outside of the province. Almost one-half (46%) of the Ontario residents were living in or around Metropolitan Toronto.

In December 1974, 573 of the hygienists who participated in the survey held current Ontario licences; 508 were employed (in Ontario or elsewhere). Over one-half of the respondents had been employed continuously from the month following graduation until December 1974; almost nine-tenths had been employed at least 50% of the time. Respondents had held a mean of 2.8 different dental hygiene positions and had experienced a mean of 0.7 periods of unemployment. Of the 170 respondents who reported that they were unemployed in December 1974, only 16 indicated that they definitely did not intend to return to work as dental hygienists.

The 678 respondents had held a total of 1,905 dental hygiene positions. The mean duration of positions held was 2.0 years. Most frequently, between 48 and 50 weeks of work per year were required for hygiene positions. Just over one-half of the positions involved 35 or more hours of work per week. Over three quarters (77%) of the positions held by the respondents were in private practice; 17% were in public health; 5% in dental auxiliary education and 1% in hospitals.

The respondents had experienced a total of 452 periods of unemployment. The mean duration of unemployed periods was 3.0 years.

Data from the survey indicated that there was a steady decline in the percentage of Ontario graduates employed (either full or part time) from one to thirteen years following graduation. The percentage employed dropped from 98% one year after graduation to 44% thirteen years after graduation. The average rate of attrition over the thirteen years was 4.5% per year. Between 13 and 21 years following graduation the percentage employed fluctuated, never dropping below 43%.

TABLE OF CONTENTS

1.	INTRODUCTION		
			Page
1.1	Background of the Study		1
1.2	Search for an Existing Source of Data		2
1.3	Review of the Literature		3
1.3.1	The Ontario and Canadian Dental Hygienists' Associations Studies--1973		3
1.3.2	The Wisconsin Survey--1965		4
1.3.3	The American Dental Hygienists' Association Survey--1954 ..		5
1.3.4	The U.S. Department of Health, Education and Welfare Survey--1966-1968		7
1.3.5	The Canadian Department of National Health and Welfare Study--1968-1973		8
1.4	Objectives and Scope of the Study		10
2.	SURVEY METHODOLOGY		
2.1	Questionnaire Design and Pretest		12
2.2	Mailing		13
2.3	Data Processing and Analysis		13
2.3.1	Hand Edit		13
2.3.2	Coding		14
2.3.3	Analysis		15
3.	CHARACTERISTICS OF RESPONDENTS		
3.1	Response Rate		17
3.2	Place of Residence		17
3.3	Sex		23
3.4	Age and Marital Status		23
3.5	Place and Year of Graduation		27
3.6	First Year of Registration in Ontario		27
3.7	Summary and Discussion		30
4.	ATTRITION RATE		
4.1	Definition of Attrition Rate		32
4.2	Calculation of Attrition Rate in Previous Studies		33
4.3	The Rate of Attrition of 1953 to 1974 Ontario Graduates in Dental Hygiene		34
4.4	Comparisons with Earlier Findings		36
4.4.1	Comparison with the 1954 A.D.H.A. Survey		36
4.4.2	Comparison with the 1966 to 1968 U.S. Department of Health, Education and Welfare Survey		40
4.5	Decline in the Number of Hours Worked per Year		42
4.6	Summary and Discussion		48

5.	EMPLOYMENT HISTORY	Page
5.1	Percentage of Time Employed Since Graduation	51
5.2	Number of Positions Held	51
5.3	Number of Consecutive Positions Held	54
5.4	Number of Periods of Unemployment	54
5.5	Intentions to Return to Work	57
5.6	Summary and Discussion	58
6.	CHARACTERISTICS OF POSITIONS HELD AND UNEMPLOYED PERIODS	
6.1	Duration of Positions Held	60
6.2	Weeks of Work per Year Required for Positions Held	61
6.3	Hours of Work per Week Required for Positions Held	61
6.4	Location of Positions Held	61
6.5	Type of Practice	64
6.6	Duration of Unemployed Periods	64
6.7	Summary and Discussion	67
7.	CONCLUSIONS	
	APPENDIX	

LIST OF TABLES

	Page
1. Percentage of Graduates Employed from One to Ten Years After Graduation (1954 American Dental Hygienists' Association Survey)	6
2. Proportion of Licenced Hygienists Employed by Age Group (1966-1968 U. S. Department of Health, Education and Welfare Survey)	8
3. Attrition Rates of Licenced Dental Hygienists (1968-1973 Canadian Department of National Health and Welfare Study)	9
4. Geographical Distribution of All Respondents and Active Respondents and Percentage of Respondents Active by Region	19
5. Dentist to Population, Responding Active Hygienist to Population, and Responding Active Hygienist to Dentist Ratios	21
6. Size of Community of Residence of All Respondents and Active Respondents and Percentage of Respondents Active by Community Size	22
7. Age Distribution of All Respondents and Active Respondents and Percentage of Respondents Active by Age	24
8. Marital Status of All Respondents and Active Respondents and Percentage of Respondents Active by Marital Status	25
9. Age by Marital Status	25
10. Employment Status by Age and Marital Status	26
11. Place of Graduation of All Respondents and Active Respondents and Percentage of Respondents Active by Place of Graduation	27
12. Year of Graduation of All Respondents and Active Respondents and Percentage of All Respondents Active by Year of Graduation	28
13. First Year of Registration in Ontario of All Respondents and Active Respondents and Percentage of Respondents Active by First Year of Registration in Ontario	29
14. Number and Percentage of Ontario Graduates in Each Graduating Class Employed Each Year After Graduation	35
15. The Rate of Attrition of 1953 to 1974 Ontario Graduates in Dental Hygiene	37

LIST OF TABLES (cont'd)

	Page
16. Comparison of Rates of Attrition for 1914 to 1954 U.S. and 1953 to 1974 Ontario Graduates in Dental Hygiene	38
17. Projected Numbers and Percentages of Hygienists Employed From One to Ten Years After Graduation	39
18. Comparison of Rates of Employment of 1966 to 1968 U.S. and 1974 Ontario Licencees in Dental Hygiene	41
19. Mean Number of Hours Worked Per Year by All Employed Ontario Graduates by Year of Graduation	43
20. Number and Percentage of Employed Ontario Graduates from Each Class Working 1,200 Hours or More Each Year After Graduation	44
21. Number and Percentage of Employed Ontario Graduates from Each Class Working 1,680 Hours or More Each Year After Graduation	45
22. Mean Number of Hours Worked Per Year by All Employed Ontario Graduates and Number and Percentage Working 1,200 Hours or More and 1,680 Hours or More per Year	47
23. Percentage of Time Employed Since Graduation by Age	52
24. Number of Positions Held Since Graduation by Age	53
25. Number of Consecutive Positions Held Since Graduation by Age	55
26. Number of Periods of Unemployment Since Graduation by Age	56
27. Intentions to Return to Work by Age	57
28. Duration of Positions Held	60
29. Weeks of Work Per Year Required for Positions Held	62
30. Location of Positions Held	63
31. Changes Over Time in the Number and Percentage of Dental Hygiene Positions Devoted to Different Types of Practice	65
32. Duration of Unemployed Periods	66

1. INTRODUCTION

1.1 Background of the Study

Dental hygiene is a relatively young profession in Ontario--the first class of dental hygienists graduated in 1953.¹ At the time the present study was undertaken, little was known about the career patterns of dental hygienists in the province. No comprehensive studies of the working careers of hygienists had been carried out. Knowledge of employment and attrition rates, number of weekly and yearly hours worked, trends in these variables over time, and other information essential to the planning of dental health care delivery in the province, was lacking. In this context, a question posed by a senior dental official (regarding the rate of attrition of dental hygienists from the work force) acted as a stimulus which led the Dental Health Care Services Research Unit of the University of Toronto Faculty of Dentistry, to investigate the possibility of undertaking a study to obtain information on the working careers of dental hygienists in Ontario.

The projected study was timely. Legislation providing for the training of dental auxiliaries (preventive dental assistants and hygienists) with expanded duties was pending; the new training programs were to be conducted in community colleges.² Until 1974, all training of hygienists in Ontario had taken place at the University of Toronto Faculty of

¹ Ontario was the first province in Canada to set up a program to train dental hygienists. The first hygienists to be registered in Ontario (in 1951) were trained outside the country.

² The Health Disciplines Act, referred to here, was proclaimed law on July 14, 1975.

Dentistry.³ Information on the careers of hygienists who had trained and/or registered to practise in the province prior to the proposed changes would be useful in planning, implementing and evaluating the new scheme.

1.2 Search for an Existing Source of Data

The Royal College of Dental Surgeons (R.C.D.S.) is the licencing body for dental hygienists in Ontario. Licences are renewable annually and application forms are mailed each December to all hygienists licenced in the province at the time. (See Appendix for a copy of the 1975 application form mailed to licenced hygienists in December, 1974.) Completed 1975 renewal forms provided information on hygienists' marital status; place of residence; education (year of graduation and other academic credits); employment (positions held, hours worked per week, type of practice); and reason for not renewing licence (if applicable). The possibility of using past licence renewal forms as the source of data on the working careers of dental hygienists was investigated. It was found that the information requested on the forms was not consistent over time and the information provided was not sufficiently complete for this purpose. At this point a decision was made to undertake a survey to obtain the desired information. The survey was to be conducted by the Dental Health Care Services Research Unit in co-operation with the R.C.D.S.

³ Some training of dental hygienists had also been conducted at the Canadian Armed Forces base at Camp Borden, Ontario. In this report the term "Ontario graduates" will be used to refer to University of Toronto graduates only. A three-year program for the training of dental hygienists was instituted at the Algonquin College of Applied Arts and Technology in Ottawa in September, 1974.

1.3 Review of the Literature

1.3.1 The Ontario and Canadian Dental Hygienists' Associations Studies - 1973⁴

Profiles of dental hygienists licenced in Ontario and in Canada have been developed in two recent studies. The Ontario study utilized information routinely provided by hygienists completing 1973 licence renewal forms (distributed in December, 1972). Data for the national study were obtained from a survey conducted by the Canadian Dental Hygienists' Association in June, 1973.⁵

Of the 474 Ontario licencees, 450 (94.9%) resided in Ontario and of these, 197 (43.8%) resided in or near Toronto. Of the 1,089 dental hygienists in Canada, 513 (47.1%) were from Ontario. Ontario residents made up 44.9% of the respondents to the national survey. Seventy-nine percent of the national sample was made up of hygienists who resided in an urban area in Ontario, British Columbia or Alberta.

Data collected in these studies indicated that 78% and 76% of the hygienists in Ontario and Canada respectively, were employed. Of those employed, 76% and 74% respectively worked for private practitioners, and 24% and 26% worked in public health, dental auxiliary education, hospitals or research.

Fifty-seven percent of the national respondents were employed more than three days per week; 19%, one to three days per week; and 3%, no more than three days per month. This type of information was not available for the Ontario hygienists.

⁴ Unpublished study conducted by Roberta Adamson for the O.D.H.A. and Kline, C. and Sipko, K., "CDHA Manpower and Utilization Survey Results", The Canadian Dental Hygienist, Vol. 8, No. 2, (Summer, 1974), pp. 29-31.

⁵ Data is based on completed returns from 492 (45.2%) of the 1,089 known hygienists in Canada.

Information on the intentions of unemployed hygienists to return to work was collected for the national sample only--98% of unemployed hygienists indicated that they intended to return to work.

1.3.2 The Wisconsin Survey--1965⁶

A survey of the dental hygiene profession was conducted in Wisconsin in 1965. Questionnaires were sent to the 1,037 hygienists registered in the state; replies were received from 591 (57.0%).

One-half (50.8%) of the respondents were under 30 years of age; 27.4% were between 30 and 39 years of age; 13.3% were between 40 and 49; and 8.5% were 50 years of age or more. Two-fifths (19.1%) of the respondents were single; 77.1% were married; and 3.8% were divorced or widowed or did not state their marital status.

Exactly one-half of the respondents were employed. Of the single respondents, 89.3% were employed. The median age of single respondents was 24 years, 4 months. Of the married respondents, 39.4% were employed. The median age of married respondents was 30 years, 9 months. There were no significant differences in the proportion of married respondents in each age group who were employed. Of the non-practising married respondents, 10.8% indicated that they were not interested in returning to practice; 41.9% indicated that they were interested in returning to practice; and the remainder (47.3%) gave equivocal responses. Younger respondents in this category were more likely to indicate an interest in returning to practice than older respondents.

⁶ Ellerby, H., Krippene, B., and Linn, E., "Study of Dental Hygienists Registered in Wisconsin," Journal of the American Dental Association, Vol. 76, No.2, (Feb., 1968), pp. 346-353.

An attempt was made, in the Wisconsin study, to obtain data which could help support or refute the widespread belief that dental hygienists leave their positions frequently. Respondents were asked to list their last five positions and the duration of each. The mean duration of all positions listed was 27 months. When short-term positions (that is, positions of less than one year's duration) were eliminated, the mean duration was extended to 39 months. The youngest respondents were most likely to report having held short-term positions. Respondents under 30 represented 17% of the total career years, 47% of all positions reported, and 64% of all positions held less than a year.

1.3.3 The American Dental Hygienists' Association Survey -- 1954⁷

In 1954 a survey was conducted of the working careers of approximately 12,600 dental hygienists who had graduated in the U.S. after 1914. Data from the survey can be used to estimate the proportion of graduates who can be expected to be licenced and practising in each year up to 40 years following graduation. The estimates were made by calculating the proportion of respondents who were licenced and the proportion who were both licenced and practising one year after graduation, two years after graduation, up to 40 years after graduation. If it is assumed that a class of dental hygienists will have an attrition rate for each year after graduation comparable to that derived in the 1954 U.S. survey, the proportion of the class which can be expected to be licenced and practising at a given point in the future can be estimated.

⁷ Health Manpower Source Book, Section 8, "Dental Hygienists",
 U.S. Department of Health, Education and Welfare, Public Health
 Service Publication No. 263. (Out of print)

Table 1 indicates the percentage of graduates who were found to be employed from one to ten years after graduation. Between 11 and 35 years after graduation the proportion of graduates employed in any given year fluctuated between 15% and 23%.

TABLE 1
PERCENTAGE OF GRADUATES EMPLOYED
FROM ONE TO TEN YEARS AFTER GRADUATION
(1954 American Dental Hygienists' Association Survey)

Years After Graduation	Percentage Employed %
1	72
2	56
3	53
4	44
5	42
6	38
7	36
8	28
9	22
10	21

A different trend appeared for those hygienists who were licenced but not necessarily practising. The percentage of hygienists who were licenced declined almost linearly to 50% 20 years after graduation while the percentage who were actually practising had reached 50% approximately three years after graduation. Between 20 and 30 years after graduation, the percentage of graduates who were licenced declined slowly to 45%; after 30 years it again dropped more sharply.

1.3.4 The U.S. Department of Health, Education and Welfare Survey -
- 1966-1968⁸

From 1966 through 1968 a national survey of licenced dental hygienists was conducted by the American Association of Dental Examiners for the Division of Dentistry, Manpower Development Branch, U.S. Department of Health, Education and Welfare. Hygienists who responded to the survey were grouped by age. The number of respondents in each age group who reported that they were employed was divided by the total number of respondents in the group to obtain figures representing the proportion of licenced hygienists in each age group who were practising. These proportions can be used to estimate the number of licenced hygienists employed at a given point in time. The proportions that were calculated are shown in Table 2.

⁸ Joseph F. Nevin, personal communication, May 23, 1974.

TABLE 2

PROPORTION OF LICENCED HYGIENISTS EMPLOYED BY AGE GROUP
(1966-1968 U.S. Department of Health, Education and Welfare Survey)

Age Group	Proportion Employed
Under 25	.8625
25 - 29	.6135
30 - 34	.5141
35 - 39	.5632
40 - 44	.6571
45 - 49	.6804
50 - 54	.6925
55 - 59	.7263
60 and over	.6368

1.3.5 The Canadian Department of National Health and Welfare Study -
- 1968-1973 ⁹

The Health Manpower Directorate of Health and Welfare Canada has calculated attrition rates for licenced dental hygienists in Canada for the years 1968 to 1973. For each year the number of graduates was added to the number of hygienists licenced in the previous year, (the stock), to obtain a

⁹ Canada, Department of National Health and Welfare, Dental Manpower Supply and Requirements for Canada, Prepared by J. Aziz and B. Leung, Health Manpower Report No. 1/74.

theoretical total of licenced hygienists. The attrition rate was calculated by subtracting the actual total number of licenced hygienists from the theoretical total, dividing the difference by the theoretical total and multiplying the resulting figure by 100. (See Table 3.) For the years 1970 and 1973, a negative attrition rate was obtained. This could be accounted for by the immigration to Canada of dental hygienists trained outside the country and by the re-activation of licences which had lapsed for a period of longer than one year. As with the previous two studies, the attrition rates calculated (or the mean attrition rate for the six-year period) can be used to predict the supply of licenced dental hygienists at a given point in the future.

TABLE 3

ATTRITION RATES OF LICENCED DENTAL HYGIENISTS

(1968-1973 Canadian Department of National Health and Welfare Study)

Year	A Number of Graduates	B Stock	A+B Theoretical Total	C Actual Total	$\frac{(A+B) - C}{A+B} \times 100$ Attrition Rate
1968	86	476	562	544	3.203
1969	87	544	631	617	2.219
1970	110	617	727	746	-2.613
1971	125	746	871	849	2.526
1972	139	849	988	987	0.101
1973	133	987	1,120	1,124	-0.357

1.4 Objectives and Scope of the Study

With the exception of the 1973 Canadian Dental Hygienists' Association survey and the 1954 American Dental Hygienists' Association survey, all the studies described in the previous section (1.3) focused on licenced dental hygienists only. The present survey was designed to include all hygienists who ever graduated in Ontario and all other hygienists who ever registered to practise in the province.¹⁰ The main objective of the survey was to describe the working careers of dental hygienists in Ontario.

The survey was also designed to obtain data which could help support or refute certain commonly held views about the career patterns of dental hygienists. Some of these views are expressed in the following statements:

".... the working life of the hygienist is probably less than half that of the dentist."¹¹

".... it is obvious that the hygienist's career is likely to be interrupted by marriage and child-bearing and that in many cases she is likely to leave her profession after only a few years of service."¹²

"The attrition rate for dental hygienists is very high, resulting in a great turnover and oftentimes lack of continuity of service."¹³

¹⁰ A total of 622 persons graduated as dental hygienists in Ontario between 1953 and 1974. Of these, 592 (95.2%) registered to practise in the province. In addition, 149 hygienists trained outside the province registered to practise in Ontario between 1951 and 1974. The total number of hygienists who ever graduated and/or registered to practise in Ontario as of December 1974 was 771.

¹¹ R. K. House, Dentistry in Ontario, A Study for the Committee on the Healing Arts, (Toronto: The Queen's Printer), 1970, p.84.

¹² Loc. cit.

¹³ M. W. Maclean, "The Dental Hygienist in Public Health Practice", Submitted in partial fulfillment of the requirements of the Diploma Course in Dental Public Health, Faculty of Dentistry, University of Toronto, 1968, p.9. (Unpublished)

"Because hygienists often work on a daily fee basis the profession is one that lends itself to part-time employment." ¹⁴

"The average private practitioner does not perceive the need for a full-time dental hygienist and as a result part-time status has been prescribed for the hygienist in this type of practice." ¹⁵

"Dental hygienists leave their positions too frequently and thereby disrupt the office routines established by the dentist." ¹⁶

¹⁴ Globe and Mail, October 29, 1974.

¹⁵ P. Johnson, personal communication, September 1975.

¹⁶ F. Popovich, personal communication, September 1975.

2. SURVEY METHODOLOGY

2.1 Questionnaire Design and Pretest

A questionnaire was developed for the dental hygienists survey and pretested on 67 hygienists who attended the Academy of Dentistry's annual Winter Clinic in November, 1974.¹⁷ (For a copy of the pretest questionnaire, see Appendix.) The primary concern of the researchers at the time of the pretest was to ascertain whether or not it was possible for respondents to recall and report details of all the dental hygiene positions they had held since graduation. The questionnaires were administered in well under 30 minutes. No major difficulties were encountered. Of the 67 questionnaires distributed, 65 were returned fully completed.

Following the pretest the preliminary questionnaire was shortened and simplified. (For a copy of the final version of the questionnaire see Appendix.) The final version of the questionnaire contained a brief introduction which replaced the traditional covering letter:

" In these days of changing dental auxiliary roles and educational programs, it is important to document the work-life and employment activities of dental hygienists. Please take a few minutes of your time to complete this questionnaire and return it in the stamped enclosed envelope. Thank you. We are trying for a 100 percent response. "

The introduction was followed by a short section requesting basic demographic information (name, place of residence, marital status, and year of birth); place and year of graduation; and first year of registration in Ontario. The remainder of the questionnaire related to employment. In Part 1 respondents were asked to indicate the number of years since

¹⁷ The Winter Clinic is an annual meeting of the Toronto dental community.

graduation that they had been employed (and not employed) as hygienists; in Part II they were asked to provide detailed employment histories;¹⁸ and in Part III unemployed respondents were asked to indicate whether or not they intended to return to work as hygienists.

2.2 Mailing

Of the 771 dental hygienists who ever graduated and/or registered to practise in Ontario, 612 (79.4%) were licenced in the province in December, 1974. Current addresses were readily available for these people. With the assistance of the Ontario Dental Hygienists' Association and other provincial Associations, the Canadian and American Dental Hygienists' Associations, the Secretary of the University of Toronto Faculty of Dentistry, and other sources, addresses were obtained for the majority of the 159 hygienists who were not licenced in December 1974. Mailing of the survey forms began on January 27, 1975. A follow-up letter was mailed on March 20, 1975. (For a copy of the follow-up letter, see Appendix.)

2.3 Data Processing and Analysis

2.3.1 Hand Edit

Prior to the actual coding of the survey questionnaires, a hand edit of the returned forms was carried out. The following checks were performed:

- 1) name, registration number, address, first year of registration in Ontario, and place and year of graduation were cross-checked with R.C.D.S. records (where available);

¹⁸ For each dental hygiene position held since graduation (beginning with the most recent), respondents were asked to indicate the time span and duration (e.g. 1969-1971, 2 1/2 years); the type of practice; the average number of hours worked per week and weeks worked per year (excluding paid holidays); and the province or country of employment.

- 2) the number of employed and unemployed years reported and the reported chronology and duration of positions held was checked to verify that: the number of employed and unemployed years totalled the number of years since graduation; and the unemployed time could be divided up (if necessary) and inserted between the periods of employment to form a chronological sequence from the month following graduation to December 1974.¹⁹
- 3) in cases in which respondents reported working at more than one (part-time) job in the same period, a check was performed to verify that the total number of hours worked per week did not exceed 45;²⁰
- 4) a final check was made to verify that instructions appeared to have been followed and responses were in the desired format.

In the course of the hand edit, small changes were made on the survey forms in obvious cases of misinterpretation of the instructions, omissions and minor errors.

2.3.2 Coding

Upon completion of the hand edit, the information on the survey forms was coded and transferred onto computer cards.²¹ Information relating to each different dental hygiene position held and each period of unemployment

¹⁹ A list of Ontario graduates who graduated in November was available. All other Ontario graduates were presumed to have graduated in May. Graduates from outside Ontario were presumed to have graduated in May unless there was information to suggest a November graduation.

²⁰ In some cases the number of weekly hours worked did exceed 45. This could generally be accounted for by evening, Saturday or vacation employment. Only one, (the longest,) of two or more part-time jobs held at the same time was included in the development of the chronological sequence of positions held and periods of unemployment.

²¹ In approximately 25% of the cases, data were coded on the survey forms and keypunched (by hand) onto computer cards. In 75% of the cases, data were coded on optical scanning forms and keypunched onto computer cards using the appropriate equipment.

was recorded on a separate computer card. A complete record for one respondent consisted of:

one card on which was recorded basic demographic information, place and year of graduation, first year of registration in Ontario, number of years employed and unemployed since graduation, and whether or not the respondent intended to return to work (if not currently employed); and

a number of additional cards (corresponding to the number of different positions held plus the number of periods of unemployment) on which was recorded the time span and duration of the position or period of unemployment and, for the periods of employment, the type of practice, the average number of hours worked per week and weeks worked per year (excluding paid holidays) and the province or country of employment.

2.3.3 Analysis

All dental hygienists who had ever graduated and/or registered to practise in Ontario as of December 1974 were included in the survey. Among the respondents were hygienists who were active (that is, employed) and those who were inactive; hygienists who held current Ontario licences and those who did not; and hygienists who were Ontario residents and those who were residing elsewhere.

Analysis of the data was conducted as follows:

1. Descriptive data (place of residence, sex, age, marital status, place and year of graduation, and first year of registration in Ontario) were compiled for all respondents and for active respondents, and the percentage of respondents in different descriptive categories who were active was calculated. (For example 28.5% of all respondents were under 25 years of age; 36.2% of active respondents were under 25; 95.3% of all respondents under 25 were active.)
2. Hygienist to population and hygienist to dentist ratios were calculated for different regions of the province and for the province as a whole.
3. The percentages of Ontario graduates, licencees and residents who were active in December 1974 were calculated.

4. The number and percentage of Ontario graduates who were employed in each year following graduation was calculated for each graduating class separately and for all Ontario graduates together. Attrition rate was defined as the change in the percentage of Ontario graduates who were employed in each year following graduation.
5. The mean number of hours worked in each year following graduation by employed Ontario graduates was calculated separately for each graduating class and for all Ontario graduates together. The number and percentage of employed graduates who worked 1,200 hours or more (that is, an average of 25 hours per week for 48 weeks), and 1,680 hours or more (an average of 35 hours per week for 48 weeks) in each year following graduation was also calculated.
6. Respondents were divided into three groups by age and their individual employment histories were analyzed in terms of: the percentage of time since graduation employed (either part or full time) in dental hygiene positions; the number of different positions held; the number of consecutive positions held (counting only one of two or more positions held concurrently); the number of periods of unemployment; and the intentions of unemployed hygienists to return to work.
7. Dental hygiene positions were analyzed in terms of: duration; weeks worked per year; hours worked per week; location; and type of practice.
8. Changes over time in the proportion of all positions devoted to different types of practice were traced.
9. The duration of periods of unemployment was calculated.

3. CHARACTERISTICS OF RESPONDENTS

3.1 Response Rate

Completed survey forms were obtained from 678 (87.9%) of the 771 dental hygienists who graduated and/or registered to practise in the province of Ontario between 1951 and December 1974. Seven-eighths (87.5%) of the completed forms were returned prior to the mailing of the follow-up letter. This extremely high response rate may be partially accounted for because the hygienists agreed with the researchers that: "In these days of changing dental auxiliary roles and educational programs, it is important to document the work-life and employment activities of dental hygienists."

Of the 622 dental hygienists who had graduated in Ontario, 564 (90.7%) returned completed survey forms; of the 149 graduates from outside the province who had registered to practise in Ontario, 114 (76.5%) returned completed forms.²² Of the 612 dental hygienists licenced in Ontario as of December 1974, 573 (93.6%) completed and returned the survey form.

Non-respondents included 58 Ontario graduates and 35 other graduates who had registered to practise in Ontario. Three persons who returned incomplete forms and three persons who returned their survey forms after the analysis had begun were included in the category of non-respondents.

3.2 Place of Residence

Of the 678 dental hygienists who responded to the survey, 561 (82.7%) resided in Ontario and 117 (17.3%) resided outside of the province. Of the

²²Only 30 Ontario graduates failed to register to practise in the province. Of these, 23 returned completed survey forms and 7 are included in the category of non-respondents.

508 active hygienists, (that is, hygienists employed either full or part time) 432 (85.0%) resided in Ontario and the remainder (N= 76, 15.0%) resided elsewhere.

Table 4 shows the distribution of responding hygienists and responding active hygienists within the province of Ontario.²³ Of the 561 respondents who were Ontario residents, 255 (45.5%) lived in York County (that is, Metropolitan Toronto and its surrounding area). The second largest concentration of hygienists was in the Niagara-Hamilton area (N=89, 15.9%).²⁴

²³ The eight geographical areas referred to in this report correspond to the eight districts defined by the Royal College of Dental Surgeons. They were comprised, in 1974, of the following counties and districts:

1. East and Northeast Ontario - Carleton; Frontenac; Lanark; Leeds and Grenville; Lennox and Addington; Prescott and Russell; Stormont, Dundas and Glengarry; Renfrew.
2. Southeast Ontario - Haliburton; Hastings; Northumberland; Durham and Ontario; Prince Edward; Peterborough; Victoria; Muskoka.
3. North and Northwest Ontario - Algoma; Kenora; Manitoulin; Nipissing; Parry Sound; Rainy River; Sudbury; Thunder Bay; Cochrane; Temiskaming.
4. York County.
5. North Midwest Ontario - Bruce; Dufferin; Grey; Huron; Perth; Simcoe.
6. Southwest Ontario - Elgin; Essex; Kent; Lambton; Middlesex.
7. Central Southwest Ontario - Brant; Halimand-Norfolk; Oxford; Waterloo; Wellington.
8. Niagara--Hamilton - Halton; Niagara; Peel; Wentworth.

²⁴ In December 1974, 38.3% of the 3,534 registered dentists residing in Ontario lived in York County and 15.7% lived in the Niagara-Hamilton area.

TABLE 4
GEOGRAPHICAL DISTRIBUTION OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY REGION

Region	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
East & Northeast Ontario	47	(8.4)	39	(9.0)	83.0
Southeast Ontario	39	(7.0)	27	(6.3)	69.2
North & Northwest Ontario	23	(4.1)	21	(4.9)	91.3
York County	255	(45.5)	194	(44.9)	76.1
North Midwest Ontario	24	(4.3)	18	(4.2)	75.0
Southwest Ontario	37	(6.6)	25	(5.8)	67.6
Central Southwest Ontario	47	(8.4)	35	(8.1)	74.5
Niagara - Hamilton	89	(15.9)	73	(16.9)	82.0
Total	561	(100)	432	(100)	77.0

Table 5 compares the dentist to population ratio with the responding active hygienist to population ratio and also indicates the ratio of responding active hygienists to dentists. There was an average of 18,736 persons per active hygienist and 8 dentists per active hygienist.²⁵ The responding active hygienist to population ratio ranged from 1:12,264 in the area surrounding Toronto (York County) to 1:39,512 in the North and Northwest region. (The corresponding dentist to population ratios were 1:1,758 in the area surrounding Toronto and 1:3,687 in the North and Northwest region.) The responding active hygienist to dentist ratio ranged from 1:7 in the Metropolitan Toronto area and Central Southwest Ontario to 1:15 in Southwest Ontario.

Table 6 shows the distribution of Ontario hygienists according to size of community of residence. Approximately three-fifths of the respondents resided in communities of 100,000 persons or more; two-fifths resided in Metropolitan Toronto (Ontario's only city with a population of over 500,000).

Of the 117 respondents who resided outside of Ontario over three-quarters (N=90, 76.9%) were living in other Canadian provinces; 20 (17.1%) resided in the U.S. and 7 (6.0%) elsewhere. Of the 76 active hygienists residing outside the province, 65 (85.5%) were living in other Canadian provinces; 8 (10.5%) in the U.S.; and 3 (3.9%) elsewhere.

²⁵ See Footnote Table 5.

TABLE 5

DENTIST TO POPULATION, RESPONDING ACTIVE HYGIENIST TO POPULATION,
AND RESPONDING ACTIVE HYGIENIST TO DENTIST RATIOS*

Region	Assessed Population	Dentist	Responding Active Hygienists	Dentist to Population Ratio	Responding Active Hygienist to Population Ratio	Responding Active Hygienist to Dentist Ratio
East & Northeast Ontario	993,162	410	39	1: 2,422	1: 25,466	1: 11
Southeast Ontario	599,010	215	27	2,786	22,186	8
North & Northwest Ontario	829,756	225	21	3,687	39,512	11
York County	2,379,288	1,353	194	1,758	12,264	7
North & Midwest Ontario	434,219	166	18	2,615	24,123	9
Southwest Ontario	909,996	367	25	2,479	36,400	15
Central Southwest Ontario	665,361	244	35	2,726	19,010	7
Niagara - Hamilton	1,283,208	554	73	2,316	17,578	8
Total	8,094,000	3,534	432	2,290	18,736	8

* Only 39 licenced hygienists did not respond to the survey. This represents the maximum number of active hygienists not included in the calculations for Table 5. Inclusion of these hygienists would lower the hygienist to population and active hygienist to dentist ratios. The dentist to population and active hygienist to dentist ratios were calculated on the basis of the number of licenced dentists in the province. If only active dentists were included, the dentist to population ratio would be higher and the hygienist to dentist ratio lower (assuming that not all licenced dentists are practising). Data on the assessed population and the number of licenced dentists were obtained from The Proceedings of the Royal College of Dental Surgeons of Ontario, 1974.

TABLE 6

SIZE OF COMMUNITY OF RESIDENCE OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY COMMUNITY SIZE

Community Size	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
Under 2,500	37	(6.6)	25	(5.8)	67.6
2,500 - 4,999	13	(2.3)	9	(2.1)	69.2
5,000 - 9,999	22	(3.9)	17	(3.9)	77.3
10,000 - 14,999	15	(2.7)	8	(1.9)	53.3
15,000 - 29,999	42	(7.5)	29	(6.7)	69.0
30,000 - 49,999	24	(4.3)	20	(4.6)	83.3
50,000 - 99,999	75	(13.4)	58	(13.4)	77.3
100,000 - 249,999	70	(12.5)	56	(13.0)	80.0
250,000 - 500,000	38	(6.8)	34	(7.9)	89.5
Over 500,000	225	(40.1)	176	(40.7)	78.2
Total	561	(100)	432	(100)	77.0

3.3 Sex²⁶

Of the 678 hygienists who responded to the survey, 673 (99.3%) were women and only 5 (0.7%) were men. Only one of the five male hygienists graduated from the University of Toronto; four were trained at the Canadian Armed Forces base at Camp Borden. All five male hygienists were practising in December 1974.

3.4 Age and Marital Status

Most of the respondents were relatively young.²⁷ (See Table 7.) The mean age of all hygienists responding to the survey was 28.1 years, the mean age of active hygienists was slightly lower--27.3 years. Less than 5% of the respondents were 40 years of age or more; 28.5% of all respondents and 36.2% of the active respondents were under 25. Only 9 respondents under 25 were not employed.

Three-quarters of the hygienists who responded to the survey were married (N=509); 153 (22.6%) were single; and 16 (2.4%) indicated that they were neither single nor married. Only 9 (5.3%) of the hygienists who were unmarried (single or "other") were not employed. (See Table 8.)

Marital status was closely related to age. (See Table 9.) One-half (49.7%) of respondents under 25 were single compared to 16.2% of those between 25 and 29 and 7.1% of those over 30.

²⁶ Respondents were not asked to specify their sex on the survey form. Sex was inferred from first names by the coders.

²⁷ A total of only 88 hygienists had graduated in Ontario prior to 1963. Over one-half (N=352, 51.9%) of the 678 respondents graduated after 1967. (See Table 10.)

TABLE 7
AGE DISTRIBUTION OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY AGE

Age	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
Under 25	193	(28.5)	184	(36.2)	95.3
25 - 29	247	(36.4)	180	(35.4)	72.9
30 - 34	164	(24.2)	97	(19.1)	59.1
35 - 39	45	(6.6)	26	(5.1)	57.8
40 - 44	19	(2.8)	12	(2.4)	63.2
45 - 49	8	(1.2)	8	(1.6)	100
50 - 54	1	(0.1)	1	(0.2)	100
55 - 59	0	(0.0)	0	(0.0)	-
60 and over	1	(0.1)	0	(0.0)	0.0
Total	678	(100)	508	(100)	74.9

TABLE 8

MARITAL STATUS OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY MARITAL STATUS

Marital Status	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
Single	153	(22.6)	146	(28.7)	95.4
Married	509	(75.1)	348	(68.5)	68.4
Other	16	(2.4)	14	(2.8)	87.5
Total	678	(100)	508	(100)	74.9

TABLE 9

AGE BY MARITAL STATUS

Age	Single		Married		Other		Total	
	N	%	N	%	N	%	N	%
Under 25	96	(49.7)	96	(49.7)	1	(0.5)	193	(100)
25 to 29	40	(16.2)	200	(81.0)	7	(2.8)	247	(100)
30 and Over	17	(7.1)	213	(89.5)	8	(3.4)	238	(100)
Total	153	(22.6)	509	(75.1)	16	(2.4)	678	(100)

Table 10 describes employment status by age and marital status. While the percentage employed declined after 25 years of age for all respondents the decline appears to be much sharper in the case of married respondents.²⁸

TABLE 10
EMPLOYMENT STATUS BY AGE AND MARITAL STATUS

Age	Employed						Unemployed					
	Single		Married		Other		Single		Married		Other	
	N	%	N	%	N	%	N	%	N	%	N	%
Under 25	95	(99.0)	88	(91.7)	1	(100)	1	(1.0)	8	(8.3)	0	(0.0)
25 to 29	36	(90.0)	138	(69.0)	6	(85.7)	4	(10.0)	62	(31.0)	1	(14.3)
30 and over	15	(88.2)	122	(57.3)	7	(87.5)	2	(11.8)	91	(42.7)	1	(12.5)
Total	146	(95.4)	348	(68.4)	14	(87.5)	7	(4.6)	161	(31.6)	2	(12.5)

²⁸ The Wisconsin study found only slight variations in the proportion of married respondents employed in each of four age groups (under 30; 30 to 39; 40 to 49; 50 and over). Selecting a comparable sample from among the Ontario respondents, (that is, all married respondents who were licenced in the province at the time of the study, N=416,) and dividing both the Wisconsin and Ontario samples into two age groups (Under 30; 30 and over), the percentages employed by age group were: Wisconsin--under 30 (N=212) - 42.0%, 30 and over (N=240) - 37.1%; Ontario--under 30 (N=264) - 79.5%, 30 and over (N=152) - 62.5%.

3.5 Place and Year of Graduation

Of the 678 respondents, 564 (83.2%) were University of Toronto graduates; 49 (7.2%) were graduates of other Canadian universities; 5 (0.7%) were trained in the Canadian Armed Forces; 57 (8.4%) graduated in the U.S.; and 3 (0.4%) received their training elsewhere. (See Table 11.)

TABLE 11

PLACE OF GRADUATION OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY PLACE OF GRADUATION

Place of Graduation	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
University of Toronto	564	(83.2)	424	(83.5)	75.2
Other Canadian Universities	49	(7.2)	34	(6.7)	69.4
Canadian Armed Forces	5	(0.7)	5	(1.0)	100
U. S.	57	(8.4)	42	(8.3)	73.7
Other	3	(0.4)	3	(0.6)	100
Total	678	(100)	508	(100)	74.9

Table 12 indicates the year of graduation of the respondents--over one-half (N=352, 51.9%) graduated after 1967. Respondents had graduated an average of 7.3 years prior to December 1974.

3.6 First Year of Registration in Ontario

Table 13 indicates the respondent's first year of registration in Ontario. Of the 564 respondents who were Ontario graduates, 541 (95.9%) registered to practise in the province. Almost all of these first registered in their graduating year.

TABLE 12

YEAR OF GRADUATION OF ALL RESPONDENTS AND ACTIVE RESPONDENTS
AND
PERCENTAGE OF RESPONDENTS ACTIVE BY YEAR OF GRADUATION

Graduation	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
1927	1	(0.1)	0	(0.0)	0.0
1951	1	(0.1)	0	(0.0)	0.0
1952	2	(0.3)	2	(0.4)	100
1953	7	(1.0)	4	(0.8)	57.1
1954	4	(0.6)	3	(0.6)	75.0
1955	7	(1.0)	3	(0.6)	42.9
1956	9	(1.3)	6	(1.2)	66.7
1957	6	(0.9)	4	(0.8)	66.7
1958	14	(2.1)	9	(1.8)	64.3
1959	8	(1.2)	2	(0.4)	25.0
1960	5	(0.7)	3	(0.6)	60.0
1961	7	(1.0)	6	(1.2)	85.7
1962	18	(2.7)	10	(2.0)	55.6
1963	36	(5.3)	21	(4.1)	58.3
1964	45	(6.6)	27	(5.3)	60.0
1965	51	(7.5)	26	(5.1)	51.0
1966	55	(8.1)	32	(6.3)	58.2
1967	50	(7.4)	34	(6.7)	68.0
1968	44	(6.5)	37	(7.3)	84.1
1969	43	(6.3)	34	(6.7)	79.1
1970	47	(6.9)	38	(7.5)	80.9
1971	53	(7.8)	45	(8.9)	84.9
1972	57	(8.4)	56	(11.0)	98.2
1973	53	(7.8)	51	(10.0)	96.2
1974	55	(8.1)	55	(10.8)	100
Total	678	(100)	508	(100)	74.9

TABLE 13

FIRST YEAR OF REGISTRATION IN ONTARIO OF ALL RESPONDENTS
AND ACTIVE RESPONDENTS AND
PERCENTAGE OF RESPONDENTS ACTIVE BY FIRST YEAR OF REGISTRATION IN ONTARIO

First Year of Registration in Ontario	Hygienists Responding		Active Hygienists Responding		% Active
	N	%	N	%	
1951	1	(0.2)	0	(0.0)	0.0
1952	0	(0.0)	0	(0.0)	-
1953	4	(0.6)	3	(0.6)	75.0
1954	3	(0.5)	2	(0.4)	66.7
1955	6	(0.9)	4	(0.8)	66.7
1956	5	(0.8)	2	(0.4)	40.0
1957	4	(0.6)	2	(0.4)	50.0
1958	9	(1.4)	7	(1.4)	77.8
1959	3	(0.5)	1	(0.2)	33.3
1960	7	(1.1)	3	(0.6)	42.9
1961	5	(0.8)	4	(0.8)	80.0
1962	13	(2.0)	6	(1.2)	46.2
1963	33	(5.0)	21	(4.2)	63.6
1964	41	(6.3)	24	(4.8)	58.5
1965	50	(7.6)	28	(5.6)	56.0
1966	42	(6.4)	26	(5.2)	61.9
1967	46	(7.0)	30	(6.0)	65.2
1968	49	(7.5)	40	(8.0)	81.6
1969	37	(5.6)	28	(5.6)	75.7
1970	53	(8.1)	42	(8.4)	79.2
1971	60	(9.2)	49	(9.8)	81.7
1972	55	(8.4)	53	(10.6)	96.4
1973	56	(8.5)	51	(10.2)	91.1
1974	73	(11.1)	72	(14.5)	98.6
Total	655*	(100)	498**	(100)	76.0

* Twenty-three respondents who graduated in Ontario never registered to practise in the province.

** Ten of the active respondents never registered to practise in Ontario.

3.7 Summary and Discussion

Of the 678 dental hygienists who responded to the survey (representing 88% of all hygienists who ever graduated and/or registered to practise in Ontario), 83% were residing in Ontario and 17% were residing outside of the province. Almost one-half (46%) of the Ontario residents were living in and around Metropolitan Toronto; 16% were living in the Niagara-Hamilton region. Small numbers of hygienists were living and practising in every area of the province in communities of all sizes.

Virtually all dental hygienists in Ontario are women. Only 5 of the respondents were men.²⁹

The mean age of hygienists was found to be 28; the median age was 27. Less than 5% of the respondents were 40 years of age or more, while 29% were under 25. The relative youthfulness of hygienists in Ontario can be primarily attributed to two related factors. Firstly, no dental hygienists at all graduated in the province prior to 1953; and secondly, few hygienists graduated between 1953 and 1963. (Between 1953 and 1962, 5 to 16 dental hygienists graduated from the University of Toronto per year; between 1963 and 1974, 37 to 53 hygienists graduated per year.) Another contributing factor is attrition, that is, the loss of older hygienists from the work force. (See Part 4.)

Three-quarters of all hygienists who responded to the survey were married, 23% were single and only 2% indicated 'other' status. Over three-fifths of the single respondents were under 25.

Over four-fifths (83%) of the hygienists who participated in the survey graduated from the University of Toronto; of the remainder,

²⁹ Four of these were trained in the Canadian Armed Forces.

approximately one-half graduated from other Canadian universities and the Canadian Armed Forces and one-half from American institutions. (Only three respondents graduated outside of Canada or the United States.)

Three-quarters (N=508) of the 678 respondents were active in December 1974. Of the 564 respondents who were University of Toronto graduates, (representing 91% of all dental hygienists who ever graduated from that institution), three-quarters (N=424) were active. Of the 573 hygienists who were licenced to practise in Ontario in December 1974, 80% (N=456) were active. Finally, of the 561 respondents who were residing in Ontario in December 1974, (including 524 licenced and 37 unlicenced hygienists), 77% (N=432) were active. These rates of employment are comparable to those found in the recent Ontario and Canadian Dental Hygienists' Association studies. In these studies, 78% of the dental hygienists licenced in Ontario in 1973 and 76% of the hygienists who responded to a national survey conducted in 1973, were found to be employed. All of these rates of employment are considerably higher than the 50% employment rate for hygienists licenced in Wisconsin in 1965.

Younger hygienists were more likely to be active than older hygienists and unmarried hygienists were more likely to be active than married ones.

4. ATTRITION RATE

4.1 Definition of Attrition Rate

The term "attrition rate" is applied to the rate of loss of personnel from the work force. The question of the rate of attrition of dental auxiliaries is an important and controversial one. It appears to be generally accepted that dental auxiliaries have a very high rate of attrition. (See Section 1.4.) This is usually attributed to the fact that the dental auxiliary work force is overwhelmingly female.

The attrition rate of dental auxiliaries is an important factor to be considered when calculating the number of auxiliaries to be trained. A recent British Columbia study suggested that one-half of the dental hygiene work force may have to be replaced every 5.4 years³⁰ This estimate was not based on past experience, however, but on hygienists' expectations of whether or not they would be employed in the future. The number of dental hygienists in B.C. with even as many as five years past experience was very small.

In the present study, attrition rate was defined as the change in the percentage of Ontario graduates who were employed from year to year following graduation.³¹ Data were available for 554 (89.1%) of the 622 dental hygienists who graduated in the province between 1953 and 1974.³² The number of

³⁰ Children's Dental Health Research Project Report to the Minister of Health, British Columbia and the President, the College of Dental Surgeons of British Columbia, (Victoria: Queen's Printer), 1975, pp. XII 5, 6.

³¹ "Employed each year" means employed at all during the course of the year. "Year" refers to calendar year. Thus year zero is the year of graduation (e.g. for a 1953 graduate, 1953 is year zero). One year after graduation is the calendar year after graduation; for a May graduate it extends from approximately one-half to one and a half years after graduation (e.g. 1954 is one year after graduation for a 1953 graduate).

³² A total of 564 Ontario graduates responded to the survey. In 10 cases, however, the periods of employment and unemployed time indicated on the survey form could not be placed in a chronological sequence extending from the month following graduation to December 1974. These cases were deleted from the calculations in this part (4).

respondents who had spent each of zero (that is, less than one) to 21 years since graduation (potentially in the work force) was calculated and the percentage who were actually employed in each year was determined.

4.2 Calculation of Attrition Rate in Previous Studies

Attrition rates for dental hygienists were calculated in the 1954 American Dental Hygienists' Association (A.D.H.A.) study, and in studies carried out by the U.S. Department of Health, Education and Welfare and the Canadian Department of National Health and Welfare. (See Subsections 1.3.3, 1.3.4, 1.3.5.) In each of these studies attrition rate was calculated in a different manner.

The 1954 A.D.H.A. study involved a survey of all dental hygienists who had graduated in the U.S. after 1914. The proportion of respondents who were licenced and the proportion who were both licenced and practising in each year following graduation was calculated. The term "attrition rate" could be used to refer to the decline in either of these proportions from year to year as the length of time since graduation increases.

Between 1966 and 1968 a national survey of licenced dental hygienists was conducted in the U.S. for the Department of Health, Education and Welfare. The respondents were grouped by age and the proportion of respondents in each age group who reported that they were employed was calculated. In this study "attrition rate" refers to the change in the proportion of licenced hygienists in each age group who were employed. The proportion of licenced hygienists who were employed declined from .8625 for hygienists under 25 years of age to .5141 for hygienists 30 to 34 years of age, and then rose steadily to .7263 for hygienists 55 to 59. (Attrition rate can be negative.) However, while the proportion of licenced hygienists who were

employed was increasing for hygienists over 35, the proportion of graduates who were licenced was probably decreasing. Data on the proportion of graduates in each age group who were licenced were not collected.

The Canadian federal Department of Health and Welfare made use of routinely collected statistics to calculate the attrition rate of licenced dental hygienists in Canada for the years 1968 to 1973. For each year, the number of graduates was added to the number of hygienists licenced in the previous year to obtain a theoretical total number of licenced hygienists. The term "attrition rate" was used to refer to the proportion of the theoretical total represented by the difference between the theoretical and actual total number of hygienists licenced each year. As in the previous U.S. study, data on the proportion of all dental hygienists who were licenced were not collected. This study is even more limited than the previous one, however, in that no data on employment status were collected.

4.3 The Rate of Attrition of 1953 to 1974 Ontario Graduates in Dental Hygiene

Table 14 indicates the number and percentage of hygienists in each graduating class who were employed each year after graduation. The small size of graduating classes prior to 1963 makes the analysis of long-term trends problematic. Nevertheless, it does appear from the data that there is a trend for the proportion of hygienists employed to fall in the years immediately following graduation, to level off, and then to rise again. Among those who had graduated in the last ten years a trend to return to work had not yet manifested itself. On the other hand, it appears that there may be a trend for fewer of the more recent graduates to leave the work force soon after graduation.

Years After Graduation

Year of Graduation	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1953	4 (100)	4 (100)	3 (75.0)	2 (50.0)	1 (25.0)	1 (25.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	2 (50.0)	2 (50.0)
1954	4 (75.0)	3 (75.0)	3 (75.0)	3 (75.0)	2 (50.0)	2 (50.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	3 (75.0)	-
1955	6 (100)	5 (83.3)	5 (83.3)	5 (83.3)	4 (66.7)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	2 (33.3)	3 (50.0)	2 (33.3)	3 (50.0)	3 (50.0)	-	-
1956	7 (100)	7 (100)	6 (85.7)	5 (71.4)	4 (57.1)	4 (57.1)	4 (57.1)	3 (42.9)	4 (57.1)	4 (57.1)	5 (71.4)	3 (42.9)	3 (42.9)	3 (42.9)	4 (57.1)	5 (71.4)	5 (71.4)	5 (71.4)	5 (71.4)	-	-	-
1957	4 (80.0)	3 (60.0)	3 (60.0)	4 (80.0)	3 (60.0)	3 (60.0)	3 (60.0)	3 (60.0)	4 (80.0)	4 (80.0)	3 (60.0)	3 (60.0)	3 (60.0)	3 (60.0)	3 (60.0)	4 (60.0)	3 (60.0)	3 (60.0)	-	-	-	-
1958	13 (100)	12 (92.3)	12 (92.3)	10 (76.9)	7 (53.8)	4 (30.8)	6 (46.2)	4 (30.8)	5 (38.5)	4 (30.8)	3 (23.1)	5 (38.5)	6 (46.2)	6 (46.2)	7 (53.8)	8 (61.5)	9 (69.2)	-	-	-	-	-
1959	7 (100)	7 (100)	5 (71.4)	5 (71.4)	4 (57.1)	4 (57.1)	3 (42.9)	3 (42.9)	3 (42.9)	3 (42.9)	1 (14.3)	1 (14.3)	1 (14.3)	2 (28.6)	3 (42.9)	2 (28.6)	-	-	-	-	-	-
1960	5 (100)	5 (100)	4 (80.0)	4 (80.0)	3 (60.0)	3 (60.0)	2 (40.0)	2 (40.0)	2 (40.0)	3 (60.0)	3 (60.0)	4 (80.0)	4 (80.0)	3 (60.0)	3 (60.0)	3 (60.0)	-	-	-	-	-	-
1961	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	3 (75.0)	3 (75.0)	3 (75.0)	3 (75.0)	3 (75.0)	-	-	-	-	-	-	-
1962	14 (87.5)	15 (93.8)	15 (93.8)	11 (68.8)	9 (56.3)	7 (43.8)	8 (50.0)	9 (56.3)	7 (43.8)	7 (43.8)	10 (62.5)	10 (62.5)	10 (62.5)	10 (62.5)	10 (62.5)	-	-	-	-	-	-	-
1963	31 (96.8)	30 (96.8)	29 (93.5)	29 (93.5)	28 (90.3)	24 (77.4)	21 (67.7)	20 (64.5)	20 (64.5)	17 (54.8)	17 (54.8)	19 (61.3)	-	-	-	-	-	-	-	-	-	-
1964	39 (100)	39 (100)	39 (100)	37 (94.9)	38 (97.4)	33 (84.6)	35 (89.7)	26 (66.7)	26 (66.7)	26 (66.7)	24 (61.5)	-	-	-	-	-	-	-	-	-	-	-
1965	39 (90.7)	39 (90.7)	39 (90.7)	36 (83.7)	33 (76.7)	29 (67.4)	30 (69.8)	30 (69.8)	26 (60.5)	30 (69.8)	-	-	-	-	-	-	-	-	-	-	-	-
1966	36 (100)	36 (100)	35 (97.2)	35 (97.2)	34 (94.4)	32 (88.9)	28 (77.8)	25 (69.4)	24 (66.7)	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	40 (95.2)	42 (100)	40 (95.2)	36 (85.7)	37 (88.1)	36 (85.7)	33 (78.6)	31 (73.8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	36 (100)	36 (100)	35 (97.2)	35 (97.2)	35 (97.2)	31 (86.1)	30 (83.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	32 (97.0)	33 (100)	32 (97.0)	31 (93.9)	30 (90.9)	29 (87.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	35 (100)	35 (100)	34 (97.1)	34 (97.1)	35 (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	45 (100)	45 (100)	45 (100)	45 (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	47 (97.9)	48 (100)	47 (97.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	43 (93.6)	45 (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	50 (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 14

NUMBER AND PERCENTAGE
OF ONTARIO GRADUATES
IN EACH GRADUATING CLASS
EMPLOYED EACH YEAR AFTER GRADUATION*

* See Footnote 31.

Table 15 shows the rate of attrition of 1953 to 1974 Ontario graduates in dental hygiene. The percentage of graduates who were employed was: 97.3% at graduation; 90.3% three years after graduation; 70.5% six years after graduation; 56.0% nine years after graduation; and 46.5% twelve years after graduation. The steady decline in the percentage of graduates employed continued until thirteen years after graduation when it reached 43.6%. After that, the percentage employed rose and then fluctuated, only once dropping below 43.6% (to 42.9%). In the first thirteen years following graduation the largest drop in the percentage of graduates employed was 10.1% between four and five years after graduation. The average rate of attrition over the thirteen years was 4.5% per year.

4.4 Comparisons with Earlier Findings

4.4.1 Comparison with the 1954 A.D.H.A. Survey.³³

The rate of attrition of 1953 to 1974 Ontario graduates in dental hygiene was compared with that of 1914 to 1954 U.S. graduates. From Table 16 it can be seen that a much higher proportion of Ontario graduates was found to be employed. One year after graduation, 98% of the Ontario graduates were employed compared to 72% of the U.S. graduates; five years after graduation, 75% of the Ontario graduates and 42% of the U.S. graduates were employed; and ten years after graduation, 51% of the Ontario and 21% of the U.S. graduates were employed. After fluctuations between 10 and 21 years, 50% of the Ontario graduates and 20% of the U.S. graduates were found to be employed after 21 years.

Table 17 shows the differences in the cumulative number of hygienists who would be employed in eleven successive years assuming graduating classes

³³ Health Manpower Source Book, op. cit.

TABLE 15

THE RATE OF ATTRITION OF 1953 TO 1974 ONTARIO GRADUATES IN DENTAL HYGIENE

Years After Graduation	Number of Graduates	Number of Employed Graduates	Percentage of Graduates Employed %	Attrition Rate %
0	554	539	(97.3)	-
1	504	493	(97.8)	- 0.5
2	459	435	(94.8)	3.0
3	411	371	(90.3)	4.5
4	366	311	(85.0)	5.3
5	331	248	(74.9)	10.1
6	298	210	(70.5)	4.4
7	262	163	(62.2)	8.3
8	220	129	(58.6)	3.6
9	184	103	(56.0)	2.6
10	141	72	(51.1)	4.9
11	102	51	(50.0)	1.1
12	71	33	(46.5)	3.5
13	55	24	(43.6)	2.9
14	51	25	(49.0)	- 5.4
15	46	22	(47.8)	1.2
16	39	23	(59.0)	-11.2
17	26	13	(50.0)	9.0
18	21	11	(52.4)	- 2.4
19	14	6	(42.9)	9.5
20	8	5	(62.5)	-19.6
21	4	2	(50.0)	12.5

TABLE 16

COMPARISON OF RATES OF ATTRITION
FOR 1914 to 1954 U.S. AND 1953 TO 1974
ONTARIO GRADUATES IN DENTAL HYGIENE

Years After Gradu- ation	Percentage Employed		Attrition Rate	
	1954 U.S. Survey %	1974 Ontario Survey %	1954 U.S. Survey %	1974 Ontario Survey %
1	72	98	-	-
2	56	95	16	3
3	53	90	3	5
4	44	85	9	5
5	42	75	2	10
6	38	71	4	4
7	36	62	2	9
8	28	59	8	3
9	22	56	6	3
10	21	51	1	5
11	15	50	6	1
12	22	47	- 7	3
13	21	44	1	3
14	22	49	- 1	- 5
15	20	48	2	1
16	18	59	2	-11
17	23	50	- 5	9
18	19	52	4	- 2
19	17	43	2	9
20	19	63	- 2	-20
21	20	50	- 1	13

TABLE 17

PROJECTED NUMBERS AND PERCENTAGES OF HYGIENISTS
EMPLOYED FROM ONE TO TEN YEARS AFTER GRADUATION*

1954 U.S. Survey														
Year	Number Working											Cumulative Number Working	Cumulative Number Trained	Percentage Working
0	150											150	150	100.0
1	108	150										258	300	86.0
2	84	108	150									342	450	76.0
3	80	84	108	150								422	600	70.3
4	66	80	84	108	150							488	750	65.1
5	63	66	80	84	108	150						551	900	61.2
6	57	63	66	80	84	108	150					608	1,050	57.9
7	54	57	63	66	80	84	108	150				662	1,200	55.2
8	42	54	57	63	66	80	84	108	150			704	1,350	52.1
9	33	42	54	57	63	66	80	84	108	150		737	1,500	49.1
10	32	33	42	54	57	63	66	80	84	108	150	769	1,650	46.6

1974 Ontario Survey														
Year	Number Working											Cumulative Number Working	Cumulative Number Trained	Percentage Working
0	150											150	150	100.0
1	147	150										297	300	99.0
2	143	147	150									440	450	97.8
3	135	143	147	150								575	600	95.8
4	128	135	143	147	150							703	750	93.7
5	113	128	135	143	147	150						816	900	90.7
6	107	113	128	135	143	147	150					923	1,050	87.9
7	93	107	113	128	135	143	147	150				1,016	1,200	84.7
8	89	93	107	113	128	135	143	147	150			1,105	1,350	81.9
9	84	89	93	107	113	128	135	143	147	150		1,189	1,500	79.3
10	77	84	89	93	107	113	128	135	143	147	150	1,266	1,650	76.7

* Projections were made assuming graduating classes of 150 hygienists all of whom are employed immediately following graduation and attrition rates equal to those found in the 1954 U.S. and 1974 Ontario surveys.

of 150 hygienists all of whom are employed immediately following graduation, and attrition rates equal to those found in the 1954 U.S. and 1974 Ontario surveys respectively. Using the 1954 U.S. attrition rates, less than one-half ($N=769$, 46.6%) of the 1,650 hygienists trained would be expected to be employed after 11 years. Using the 1974 Ontario attrition rates, the figure would be 1,266 (76.7%) employed. In absolute terms, this amounts to almost 500 more hygienists employed after 11 years. While such an analysis involves many assumptions, it illustrates the striking effect which differing attrition rates have on manpower potential and points to the need to consider attrition rates in dental auxiliary manpower planning.

4.4.2 Comparison with 1966 to 1968 U.S. Department of Health, Education and Welfare Survey³⁴

Table 18 provides a comparison of the rates of employment of 1974 Ontario and 1966 to 1968 U.S. licencees in dental hygiene. Respondents in both samples were grouped according to age and the proportion of licenced hygienists in each age group who were employed was calculated. A higher proportion of Ontario hygienists were employed in each age group. In both samples, licenced hygienists under 25 years of age were most likely to be employed and the proportion employed declined in the 25 to 29 year age group and again in the 30 to 34 year age group and then rose and fluctuated.

³⁴Joseph F. Nevin, op. cit.

TABLE 18
COMPARISON OF RATES OF EMPLOYMENT OF 1966 to 1968 U.S.
AND
1974 ONTARIO LICENCEES IN DENTAL HYGIENE

Age Group	Percentage Employed	
	1966 to 1968 U.S. Survey %	1974 Ontario Survey %
Under 25	86.3	95.7 (N=185)
25 - 29	61.4	76.5 (N=213)
30 - 34	51.4	62.6 (N=131)
35 - 39	56.3	75.0 (N=24)
40 - 44	65.7	66.7 (N=12)
45 - 49	68.0	100.0 (N=7)
50 - 54	69.3	100.0 (N=1)
55 - 59	72.6	- -
60 and over	63.7	- -

4.5 Decline in the Number of Hours Worked per Year

Previous studies of attrition have, at best, addressed the question of what proportion of the potential dental hygiene work force was employed without addressing another question of equal importance to dental (auxiliary) manpower planners: how many hours do employed hygienists as a group, work per year. A steady decline in the proportion of Ontario graduates who were employed from one until thirteen years after graduation was observed. (The percentage of graduates who were employed declined from 97.8% one year after graduation to 43.6% thirteen years after graduation.) The question of whether there was also a decline in the mean number of hours worked per year by all employed Ontario graduates was examined.³⁵

Table 19 shows the mean number of hours worked per year by employed Ontario graduates from each graduating class. The mean number of hours worked generally declined steadily from year to year at least until approximately ten years after graduation. The number of hygienists still in the work force more than ten years after graduation was small. Nevertheless the data do suggest that the mean number of hours worked per year by all employed graduates may cease to decline and may even begin to rise about ten years after graduation.

Tables 20 and 21 show the number and percentage of employed Ontario graduates from each class who worked 1,200 hours or more (that is, an average

³⁵ The mean number of hours worked per year was sensitive to hygienists' leaving (and re-entering) the work force. For example, a hygienist who worked 36 hours per week for 20 weeks and then left the work force would contribute the same number of hours to the total worked by all employed graduates as would a hygienist who worked 15 hours per week for 48 weeks (720 hours). A change in the mean number of annual hours worked by employed graduates from year to year could result from persons becoming unemployed (or employed) during the course of a year, or from employed hygienists' working a decreased (or increased) number of hours per week.

TABLE 19
MEAN NUMBER OF HOURS WORKED PER YEAR
BY ALL EMPLOYED ONTARIO GRADUATES
BY YEAR OF GRADUATION*

43

TABLE 19

MEAN NUMBER OF HOURS WORKED PER YEAR
BY ALL EMPLOYED ONTARIO GRADUATES
BY YEAR OF GRADUATION*

* In year zero, that is, the year of graduation, May graduates had the opportunity to work a maximum of seven months and November graduates, a maximum of one month. See Footnote 31.

Years After Graduation

Year of Graduation

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1953	1,166 (4)	1,505 (4)	817 (3)	1,068 (2)	135 (1)	135 (1)	27 (1)	- (0)	- (0)	- (0)	- (0)	- (0)	- (0)	- (0)	216 (1)	1,080 (1)	2,160 (1)	1,728 (1)	1,728 (1)	1,092 (2)	1,189 (2)	
1954	1,152 (3)	1,936 (3)	1,947 (3)	1,347 (3)	1,920 (2)	1,552 (2)	2,000 (1)	1,150 (1)	1,150 (1)	1,150 (1)	1,150 (1)	1,150 (1)	1,150 (1)	1,104 (2)	1,457 (2)	1,457 (2)	1,457 (2)	1,457 (2)	1,457 (2)	1,373 (3)	-	
1955	1,074 (6)	1,763 (5)	1,523 (5)	1,232 (5)	1,034 (4)	1,084 (2)	580 (2)	339 (2)	316 (2)	400 (2)	400 (2)	400 (2)	400 (2)	400 (2)	575 (4)	875 (2)	915 (3)	1,351 (2)	1,003 (3)	1,174 (3)	-	
1956	1,176 (7)	1,789 (7)	1,261 (6)	1,220 (5)	1,098 (4)	800 (4)	923 (3)	1,224 (3)	1,172 (4)	804 (4)	574 (5)	776 (3)	871 (3)	1,307 (3)	1,099 (4)	685 (5)	894 (5)	881 (5)	720 (5)	-	-	
1957	1,072 (4)	1,956 (3)	1,956 (3)	2,001 (4)	1,893 (3)	1,880 (3)	1,880 (3)	1,553 (3)	1,245 (4)	1,282 (4)	1,127 (5)	1,161 (3)	1,413 (3)	1,413 (3)	1,168 (3)	1,200 (2)	992 (3)	877 (3)	-	-	-	
1958	1,042 (13)	1,748 (12)	1,565 (12)	1,544 (10)	1,192 (7)	1,181 (4)	718 (6)	690 (4)	730 (5)	716 (4)	748 (3)	568 (5)	969 (6)	987 (6)	969 (7)	1,061 (8)	1,140 (9)	-	-	-	-	
1959	1,036 (7)	1,883 (7)	1,661 (5)	1,227 (5)	1,439 (4)	1,439 (4)	1,714 (3)	1,714 (3)	1,087 (3)	1,279 (2)	1,575 (1)	1,575 (1)	1,575 (1)	793 (2)	683 (3)	753 (2)	-	-	-	-	-	
1960	912 (5)	1,626 (5)	1,658 (4)	1,290 (4)	1,477 (3)	1,116 (2)	1,232 (2)	1,232 (2)	961 (3)	915 (3)	849 (3)	881 (4)	862 (4)	1,157 (3)	1,157 (3)	-	-	-	-	-	-	
1961	828 (4)	1,744 (4)	1,871 (4)	1,866 (4)	1,849 (4)	1,711 (4)	1,702 (4)	1,707 (4)	1,589 (4)	1,487 (3)	1,487 (3)	1,487 (3)	1,232 (3)	1,152 (3)	-	-	-	-	-	-	-	
1962	1,121 (14)	1,668 (15)	1,359 (15)	1,398 (11)	1,603 (9)	1,580 (7)	1,442 (8)	1,051 (9)	1,036 (7)	1,120 (7)	820 (10)	847 (10)	860 (10)	-	-	-	-	-	-	-	-	
1963	1,075 (30)	1,770 (30)	1,687 (29)	1,659 (29)	1,461 (28)	1,434 (24)	1,340 (21)	1,137 (20)	806 (20)	793 (17)	829 (17)	858 (19)	-	-	-	-	-	-	-	-	-	
1964	1,009 (39)	1,688 (39)	1,556 (39)	1,608 (37)	1,402 (36)	1,217 (38)	1,096 (35)	1,144 (26)	864 (26)	861 (26)	954 (24)	-	-	-	-	-	-	-	-	-	-	
1965	966 (39)	1,731 (39)	1,513 (39)	1,482 (36)	1,345 (33)	1,227 (29)	1,201 (30)	1,125 (30)	1,193 (26)	877 (30)	-	-	-	-	-	-	-	-	-	-	-	
1966	1,036 (36)	1,641 (36)	1,565 (35)	1,500 (35)	1,435 (34)	1,298 (32)	1,208 (28)	1,224 (25)	1,187 (31)	-	-	-	-	-	-	-	-	-	-	-	-	
1967	964 (40)	1,611 (42)	1,626 (40)	1,591 (36)	1,423 (37)	1,224 (36)	1,227 (33)	1,187 (31)	-	-	-	-	-	-	-	-	-	-	-	-	-	
1968	958 (36)	1,703 (36)	1,627 (35)	1,622 (35)	1,419 (35)	1,445 (31)	1,341 (30)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1969	989 (32)	1,605 (32)	1,544 (32)	1,477 (31)	1,394 (30)	1,284 (29)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1970	1,058 (35)	1,801 (35)	1,786 (34)	1,613 (34)	1,459 (35)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1971	971 (45)	1,670 (45)	1,624 (45)	1,500 (45)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1972	1,031 (47)	1,749 (47)	1,698 (47)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1973	1,022 (43)	1,720 (43)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1974	1,009 (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

* In year zero, that is, the year of graduation, May graduates had the opportunity to work a maximum of seven months and November graduates, a maximum of one month. See Footnote 31.

Year of Graduation	Years After Graduation																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1953	4	3 ³ (75.0)	2 ¹ (33.3)	1 ¹ (50.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	1 ¹ (100)	1 ¹ (100)	1 ¹ (100)	1 ¹ (100)	1 ¹ (50.0)	1 ¹ (50.0)
1954	4	2 ² (66.7)	3 ³ (100)	2 ² (66.7)	1 ¹ (50.0)	1 ¹ (50.0)	1 ¹ (50.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	1 ¹ (50.0)	1 ¹ (50.0)	1 ¹ (50.0)	1 ¹ (50.0)	1 ¹ (50.0)	2 ² (66.7)	-
1955	6	1 ¹ (16.7)	5 ⁵ (100)	4 ⁴ (80.0)	2 ² (40.0)	1 ¹ (25.0)	1 ¹ (50.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	0 ⁰ (0.0)	1 ¹ (33.3)	1 ¹ (50.0)	2 ² (66.7)	2 ² (66.7)	-	-
1956	7	4 ⁴ (57.1)	6 ⁶ (85.7)	3 ³ (50.0)	3 ³ (60.0)	2 ² (50.0)	1 ¹ (25.0)	2 ² (66.7)	3 ³ (75.0)	2 ² (50.0)	2 ² (50.0)	1 ¹ (20.0)	1 ¹ (33.3)	2 ² (66.7)	2 ² (66.7)	2 ² (50.0)	2 ² (40.0)	2 ² (40.0)	2 ² (40.0)	-	-	-
1957	5	2 ² (50.0)	3 ³ (100)	3 ³ (100)	4 ⁴ (100)	3 ³ (100)	3 ³ (100)	2 ² (66.7)	2 ² (50.0)	2 ² (50.0)	1 ¹ (33.3)	1 ¹ (33.3)	2 ² (66.7)	2 ² (66.7)	1 ¹ (33.3)	1 ¹ (50.0)	1 ¹ (33.3)	1 ¹ (33.3)	1 ¹ (33.3)	-	-	-
1958	13	5 ⁵ (38.5)	11 ¹¹ (91.7)	9 ⁹ (75.0)	7 ⁷ (70.0)	4 ⁴ (57.1)	2 ² (50.0)	2 ² (33.3)	1 ¹ (20.0)	1 ¹ (25.0)	1 ¹ (33.3)	1 ¹ (20.0)	3 ³ (50.0)	3 ³ (50.0)	3 ³ (42.9)	4 ⁴ (50.0)	5 ⁵ (55.6)	-	-	-	-	-
1959	7	2 ² (28.6)	7 ⁷ (100)	4 ⁴ (80.0)	3 ³ (60.0)	3 ³ (75.0)	3 ³ (100)	3 ³ (100)	2 ² (66.7)	1 ¹ (33.3)	1 ¹ (50.0)	1 ¹ (100)	1 ¹ (100)	1 ¹ (50.0)	1 ¹ (33.3)	1 ¹ (33.3)	-	-	-	-	-	-
1960	5	0 ⁰ (0.0)	4 ⁴ (80.0)	3 ³ (75.0)	3 ³ (75.0)	2 ² (66.7)	2 ² (66.7)	1 ¹ (50.0)	1 ¹ (33.3)	1 ¹ (33.3)	1 ¹ (33.3)	1 ¹ (25.0)	1 ¹ (25.0)	1 ¹ (33.3)	1 ¹ (33.3)	-	-	-	-	-	-	-
1961	4	0 ⁰ (0.0)	4 ⁴ (100)	4 ⁴ (100)	4 ⁴ (100)	4 ⁴ (100)	4 ⁴ (100)	4 ⁴ (100)	4 ⁴ (100)	2 ² (66.7)	2 ² (66.7)	2 ² (66.7)	2 ² (66.7)	1 ¹ (33.3)	1 ¹ (33.3)	-	-	-	-	-	-	-
1962	16	6 ⁶ (42.9)	13 ¹³ (86.7)	9 ⁹ (60.0)	8 ⁸ (72.7)	20 ²⁰ (88.9)	6 ⁶ (85.7)	4 ⁴ (44.4)	2 ² (28.6)	3 ³ (42.9)	3 ³ (42.9)	2 ² (20.0)	3 ³ (30.0)	3 ³ (30.0)	-	-	-	-	-	-	-	-
1963	31	9 ⁹ (30.0)	28 ²⁸ (93.3)	26 ²⁶ (89.7)	26 ²⁶ (89.7)	30 ³⁰ (81.1)	17 ¹⁷ (70.8)	13 ¹³ (61.9)	8 ⁸ (40.0)	13 ¹³ (51.4)	3 ³ (20.0)	3 ³ (17.6)	5 ⁵ (31.6)	-	-	-	-	-	-	-	-	-
1964	39	16 ¹⁶ (41.0)	36 ³⁶ (92.3)	32 ³² (82.1)	30 ³⁰ (81.1)	26 ²⁶ (68.4)	20 ²⁰ (60.6)	18 ¹⁸ (51.4)	14 ¹⁴ (53.8)	9 ⁹ (34.6)	8 ⁸ (30.8)	8 ⁸ (33.3)	-	-	-	-	-	-	-	-	-	-
1965	43	11 ¹¹ (28.2)	34 ³⁴ (87.2)	28 ²⁸ (71.8)	25 ²⁵ (69.4)	22 ²² (66.7)	18 ¹⁸ (62.1)	18 ¹⁸ (60.0)	15 ¹⁵ (50.0)	13 ¹³ (54.2)	9 ⁹ (30.0)	-	-	-	-	-	-	-	-	-	-	-
1966	36	9 ⁹ (25.0)	31 ³¹ (86.1)	30 ³⁰ (85.7)	28 ²⁸ (80.0)	24 ²⁴ (70.6)	20 ²⁰ (62.5)	16 ¹⁶ (57.1)	13 ¹³ (52.0)	13 ¹³ (54.2)	-	-	-	-	-	-	-	-	-	-	-	-
1967	42	3 ³ (7.5)	36 ³⁶ (85.7)	36 ³⁶ (90.0)	31 ³¹ (86.1)	28 ²⁸ (75.7)	23 ²³ (63.9)	20 ²⁰ (60.6)	19 ¹⁹ (61.3)	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	36	7 ⁷ (19.4)	33 ³³ (91.7)	30 ³⁰ (85.7)	29 ²⁹ (82.9)	24 ²⁴ (68.6)	23 ²³ (74.2)	22 ²² (73.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	33	6 ⁶ (18.8)	28 ²⁸ (84.8)	27 ²⁷ (84.4)	25 ²⁵ (80.6)	21 ²¹ (70.0)	18 ¹⁸ (62.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	35	11 ¹¹ (31.4)	34 ³⁴ (97.1)	34 ³⁴ (100)	30 ³⁰ (86.2)	29 ²⁹ (82.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	45	4 ⁴ (8.9)	43 ⁴³ (95.6)	41 ⁴¹ (91.1)	35 ³⁵ (77.8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	48	11 ¹¹ (23.4)	44 ⁴⁴ (91.7)	44 ⁴⁴ (93.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	45	11 ¹¹ (25.6)	40 ⁴⁰ (88.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	50	6 ⁶ (12.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

44

TABLE 20

NUMBER AND PERCENTAGE
OF EMPLOYED ONTARIO GRADUATES
FROM EACH CLASS
WORKING 1,200 HOURS OR MORE
EACH YEAR AFTER GRADUATION*

* See Footnote Table 19.

TABLE 20
NUMBER AND PERCENTAGE
OF EMPLOYED ONTARIO GRADUATES
FROM EACH CLASS
WORKING 1,200 HOURS OR MORE
EACH YEAR AFTER GRADUATION*

* See Footnote Table 19.

Year of Graduation	Years After Graduation																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1953	0 (0.0)	2 (50.0)	1 (33.3)	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100)	1 (100)	1 (100)	1 (100)	1 (50.0)	1 (50.0)
1954	0 (0.0)	3 (100)	3 (100)	2 (66.7)	2 (100)	1 (50.0)	1 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (33.3)	-
1955	0 (0.0)	3 (60.0)	2 (40.0)	1 (20.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
1956	0 (0.0)	6 (85.7)	3 (50.0)	3 (60.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
1957	0 (0.0)	3 (100)	3 (100)	4 (100)	3 (100)	3 (100)	3 (100)	2 (67.7)	2 (50.0)	2 (50.0)	1 (33.3)	1 (33.3)	2 (66.7)	2 (66.7)	1 (33.3)	1 (50.0)	1 (33.3)	1 (33.3)	1 (33.3)	1 (33.3)	1 (33.3)	-
1958	0 (0.0)	10 (83.3)	9 (75.0)	7 (70.0)	3 (42.9)	2 (50.0)	2 (33.3)	1 (25.0)	1 (20.0)	1 (25.0)	1 (33.3)	1 (20.0)	2 (33.3)	2 (33.3)	2 (28.6)	1 (12.5)	3 (33.3)	-	-	-	-	-
1959	0 (0.0)	7 (100)	3 (60.0)	1 (20.0)	1 (25.0)	1 (25.0)	2 (66.7)	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
1960	0 (0.0)	3 (60.0)	3 (75.0)	1 (25.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-
1961	0 (0.0)	3 (75.0)	4 (100)	4 (100)	4 (100)	3 (75.0)	3 (75.0)	3 (75.0)	2 (50.0)	2 (33.3)	1 (33.3)	1 (33.3)	0 (0.0)	1 (33.3)	-	-	-	-	-	-	-	-
1962	0 (0.0)	10 (67.7)	7 (46.7)	4 (36.4)	5 (55.6)	4 (57.1)	4 (50.0)	1 (11.1)	1 (14.3)	1 (14.3)	1 (10.0)	1 (10.0)	1 (10.0)	1 (10.0)	-	-	-	-	-	-	-	-
1963	0 (0.0)	24 (80.0)	21 (72.4)	20 (69.0)	14 (50.0)	10 (41.7)	8 (38.1)	5 (25.0)	2 (10.0)	2 (11.8)	2 (11.8)	2 (10.5)	-	-	-	-	-	-	-	-	-	-
1964	0 (0.0)	26 (66.7)	22 (56.4)	23 (62.2)	18 (47.4)	14 (42.4)	12 (34.3)	9 (34.6)	5 (19.2)	5 (19.2)	4 (16.7)	-	-	-	-	-	-	-	-	-	-	-
1965	0 (0.0)	33 (84.6)	28 (71.8)	23 (63.9)	18 (54.6)	13 (44.8)	10 (33.3)	10 (33.3)	11 (42.3)	9 (30.0)	-	-	-	-	-	-	-	-	-	-	-	-
1966	0 (0.0)	23 (63.9)	17 (48.6)	15 (42.9)	16 (47.1)	11 (34.4)	7 (25.0)	6 (24.0)	4 (16.7)	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	0 (0.0)	25 (59.5)	24 (60.0)	21 (58.3)	15 (40.5)	8 (22.2)	8 (24.2)	7 (22.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	0 (0.0)	25 (69.4)	21 (60.0)	21 (60.0)	15 (42.9)	14 (45.2)	12 (40.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	0 (0.0)	17 (51.5)	16 (50.0)	14 (45.2)	14 (46.7)	9 (31.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	0 (0.0)	26 (74.3)	25 (73.5)	17 (50.0)	12 (34.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	0 (0.0)	24 (53.3)	23 (51.1)	19 (42.2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	0 (0.0)	33 (68.8)	34 (72.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	0 (0.0)	32 (71.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	0 (0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 21
NUMBER AND PERCENTAGE
OF EMPLOYED ONTARIO GRADUATES
FROM EACH CLASS
WORKING 1,680 HOURS OR MORE
EACH YEAR AFTER GRADUATION*

* See Footnote Table 19.

TABLE 21
NUMBER AND PERCENTAGE
OF EMPLOYED ONTARIO GRADUATES
FROM EACH CLASS
WORKING 1,680 HOURS OR MORE
EACH YEAR AFTER GRADUATION*

* See Footnote Table 19.

of 25 hours per week for 48 weeks), and 1,680 hours or more (an average of 35 hours per week for 48 weeks), respectively, each year after graduation.

No trend in the number of hours worked per year by members of successive graduating classes could be discerned--more recent graduates did not appear to work consistently more (or fewer) hours per year on the average than earlier graduates.

Table 22 indicates the mean number of hours worked per year by all employed Ontario graduates. A steady decline in the number of hours worked was observed between one and eleven years after graduation. Between one and nine years, the average decline was 100 hours per year (from 1,704 hours one year after graduation to 902 hours nine years after graduation). Between nine and eleven years the mean number of hours worked annually declined a further 21 hours (to 881 hours) and after eleven years the mean number of hours worked rose (to 968) and fluctuated between 968 and 1,361.

Table 22 also shows the number and percentage of all employed Ontario graduates who worked 1,200 hours or more and the number and percentage who worked 1,680 hours or more from zero to 21 years after graduation. There was a steady decline in the percentage of employed hygienists in both categories from one to ten years after graduation. One year after graduation, 68.6% of employed graduates were working 1,680 hours or more; five years after graduation, 37.5% of employed graduates were working 1,680 hours or more; and ten years after graduation, only 13.9% of employed graduates were working 1,680 hours or more. Corresponding figures for hygienists working 1,200 hours or more were: 90.3%, one year after graduation; 65.3%, five years after graduation; and 27.8%, ten years after graduation.

Beyond ten years after graduation the general rise in the mean annual hours worked and percentage working 1,200 and 1,680 hours or more

TABLE 22

MEAN NUMBER OF HOURS WORKED PER YEAR BY ALL EMPLOYED ONTARIO GRADUATES
AND
NUMBER AND PERCENTAGE WORKING 1,200 HOURS OR MORE AND 1,680 HOURS OR MORE PER YEAR

Years After Gradu- ation	Number Employed	Mean Number of Hours Worked per Year	Employed 1,200 Hours or More		Employed 1,680 Hours or More	
			N	%	N	%
0	539	1,014	129	(23.9)	0	(0.0)
1	493	1,704	445	(90.3)	338	(68.6)
2	435	1,608	371	(85.3)	269	(61.8)
3	371	1,541	296	(79.8)	201	(54.2)
4	311	1,418	223	(71.7)	143	(46.0)
5	248	1,305	162	(65.3)	93	(37.5)
6	210	1,233	129	(61.4)	72	(34.3)
7	163	1,165	85	(52.1)	46	(28.2)
8	129	1,024	53	(41.1)	29	(22.5)
9	103	902	33	(32.0)	21	(20.4)
10	72	892	20	(27.8)	10	(13.9)
11	51	881	16	(31.4)	6	(11.8)
12	33	968	12	(36.4)	5	(15.2)
13	24	1,067	10	(41.7)	6	(25.0)
14	25	979	9	(36.0)	5	(20.0)
15	22	980	9	(40.9)	3	(13.6)
16	23	1,110	11	(47.8)	6	(26.1)
17	13	1,106	6	(46.2)	3	(23.1)
18	11	1,023	6	(54.5)	2	(18.2)
19	6	1,361	4	(66.7)	2	(33.3)
20	5	1,261	3	(60.0)	2	(40.0)
21	2	1,189	1	(50.0)	1	(50.0)

suggests that those still employed include a core of relatively "full-time" employees. It must again be stressed that due to attrition and the youthfulness of the sample, there were few employed hygienists who had graduated more than ten years prior to December 1974.

4.6 Summary and Discussion

The survey data indicated that there was a steady decline in the percentage of Ontario graduates employed in dental hygiene positions from one to thirteen years following graduation. The percentage employed (either full or part time) dropped from 97.8% one year after graduation to 43.6% thirteen years after graduation. The average rate of attrition over the thirteen years was 4.5% per year. Beyond thirteen years following graduation the percentage employed rose and then fluctuated never dropping below 42.9%.

A decline in the mean number of hours worked per year by employed Ontario graduates was also observed. From one to nine years following graduation the mean number of hours worked per year by employed graduates dropped from 1,704 to 902 (an average decline of 100 hours per year). Beyond nine years following graduation the mean number of hours worked per year fluctuated between 881 and 1,361.

Only 102 of the 554 respondents included in the calculation of rates of attrition had graduated more than ten years prior to 1974; 229 had graduated from five to ten years prior to 1974; and 223 had graduated less than five years prior to 1974. Analysis of changes in the rate of attrition over time is problematic since rates of attrition for early graduating classes (1953 to 1962) were calculated on the basis of very small samples. Moreover, any analysis of whether or not changes have occurred in the extent to which hygienists re-enter the work force after more or less extended periods of unemployment is difficult since

many relatively recent graduates who may be planning to return to the work force have not yet done so. (See Section 5.5.) Data from the early graduating classes suggest that a trend to return to work (as well as a trend for the mean number of hours worked per year to increase) does not begin to manifest itself until at least ten years subsequent to graduation. It does appear, however, that there is a trend for fewer of the more recent graduates to leave the work force soon after graduation.

Comparing the results of the 1954 A.D.H.A. and the 1974 Ontario surveys, it was found that 1914 to 1954 U.S. graduates were less likely than 1953 to 1974 Ontario graduates to be employed from one to 21 years after graduation. This finding probably reflects the trend for an increasing percentage of more recent graduates to remain in the work force.

Comparing the results of the 1966 to 1968 U.S. Department of Health, Education and Welfare and the 1974 Ontario surveys, it was found that Ontario licencees in each age group were more likely to be employed than American licencees. Again, this finding can be at least partially explained by the trend for more recent graduates to remain in the work force. In addition, there may be an increasing tendency for hygienists of all ages (that is, earlier as well as more recent graduates) to remain in or return to the work force.

The rate of attrition of dental hygienists from the work force is an important factor to be considered in planning for the training of the correct number of hygienists to fulfill present and future requirements. Lowered rates of attrition mean that fewer new hygienists must be trained in order to maintain a given level of manpower availability. Increasing numbers of inactive hygienists returning to the work force would similarly lead to a decrease in the number of new hygienists required to produce the same output of services. Data collected in the Ontario survey suggests

that the rate of attrition of dental hygienists is lower than has been generally thought. Further research will be required to establish the rate of return to the work force of hygienists who leave for extended periods since over four-fifths of the respondents included in the analysis had graduated no more than ten years prior to the survey.

5. EMPLOYMENT HISTORY

5.1 Percentage of Time Employed Since Graduation

Over one-half (N=365, 53.8%) of the 678 respondents had been employed (either full or part time) continuously from graduation until December 1974; 596 (87.9%) had been employed 50% or more of the time since graduation. (See Table 23.) The percentage of time employed was related to age. Of the 193 respondents under 25 years of age, 89.6% had been employed continuously since graduation compared to 53.4% of those between 25 and 29 (N=247), and 25.2% of those 30 and over (N=238). Only 1.0% of the respondents under 25 were employed less than 50% of the time since graduation compared to 6.5% of those between 25 and 29, and 26.9% of those 30 and over.

5.2 Number of Positions Held

Table 24 describes the number of positions held by respondents grouped according to age--under 25 years, 25 to 29 years, and 30 years and over. One-half (N=337, 50.6%) of all respondents included in the calculations had held only one or two positions since graduation;³⁶ 567 (85.1%) had held between one and four different positions since graduation. The number of positions held was closely related to age: 46.1% of the respondents under 25 years of age had held only one position compared to 17.8% of respondents between 25 and 29 and 13.9% of respondents 30 and

³⁶ A change in the number of hours worked per week or weeks worked per year was considered to be a change in position even if a hygienist was still working for the same employer. Most changes in position, however, involved a change in employer. In 12 cases, the periods of employment and unemployed time indicated on the survey form could not be placed in a chronological sequence extending from the month following graduation to December 1974. These cases had to be deleted from the calculations in this section and in the two following sections (5.3 and 5.4).

TABLE 23
PERCENTAGE OF TIME EMPLOYED SINCE GRADUATION BY AGE

Percentage of Time Employed Since Graduation	Age						Total		Cumulative %
	Under 25		25 to 29		30 and Over		N	%	
	N	%	N	%	N	%			
0 - 9	0	(0.0)	2	(0.8)	6	(2.5)	8	(1.2)	1.2
10 - 19	0	(0.0)	2	(0.8)	12	(5.0)	14	(2.1)	3.3
20 - 29	0	(0.0)	3	(1.2)	14	(5.9)	17	(2.5)	5.8
30 - 39	1	(0.5)	5	(2.0)	15	(6.3)	21	(3.1)	8.9
40 - 49	1	(0.5)	4	(1.6)	17	(7.1)	22	(3.2)	12.1
50 - 59	3	(1.6)	9	(3.6)	27	(11.3)	39	(5.8)	17.9
60 - 69	4	(2.1)	21	(8.5)	31	(13.0)	56	(8.3)	26.2
70 - 79	3	(1.6)	17	(6.9)	20	(8.4)	40	(5.9)	32.1
80 - 89	5	(2.6)	32	(13.0)	20	(8.4)	57	(8.4)	40.5
90 - 99	3	(1.6)	20	(8.1)	16	(6.7)	39	(5.8)	46.3
100	173	(89.6)	132	(53.4)	60	(25.2)	365	(53.8)	100.1
Total	193	(100)	247	(100)	238	(100)	678	(100)	100

TABLE 24
NUMBER OF POSITIONS HELD SINCE GRADUATION BY AGE

Number of Positions Held	Age						Total	
	Under 25 Years		25 to 29 Years		30 Years and Over			
	N	%	N	%	N	%	N	%
	1	88	(46.1)	43	(17.8)	32	(13.9)	163
2	62	(32.5)	57	(23.6)	55	(23.9)	174	(26.2)
3	24	(12.6)	62	(25.6)	47	(20.4)	133	(20.1)
4	14	(7.3)	44	(18.2)	39	(17.0)	97	(14.6)
5 or more	3	(1.6)	36	(14.9)	57	(24.8)	96	(14.5)
Total	191	(100)	242	(100)	230	(100)	663*	(100)

* Three hygienists had not held any dental hygiene positions.

over. One-quarter (24.8%) of respondents 30 and over had held five positions or more compared to 14.9% of respondents between 25 and 29 and 1.6% of respondents under 25 years of age. The mean number of positions held per hygienist was 2.8.

5.3 Number of Consecutive Positions Held

In 98 cases, respondents reported holding more than one (part-time) position at the same time. In describing the number of different positions held by the hygienists in the sample it was necessary to take into consideration the fact that, in 98 cases, two or more positions were held concurrently rather than consecutively.

Counting only one of two or more positions held concurrently, Table 25 describes the number of consecutive positions held by respondents grouped according to age. Almost nine-tenths (N=594, 89.2%) of all respondents had held between one and four consecutive positions; over one-half (N=378, 56.8%) had held only one or two positions. The number of consecutive positions held was closely related to age with 56.0% of respondents under 25 holding only one consecutive position compared with 19.8% of respondents 25 to 29 and 14.8% of respondents 30 years of age and over. The mean number of consecutive positions held per hygienist was 2.5.

5.4 Number of Periods of Unemployment

Table 26 shows the number of periods of unemployment experienced by the respondents. Over one-half (N=362, 54.4%) of the 666 respondents had never been unemployed, and 200 (30.0%) had experienced only one period of unemployment. Of the 304 respondents who had been unemployed at least once, 194 (63.8%) had returned to work (at least once), and the remaining 110 (36.2%) had not. The mean number of periods of unemployment per hygienist was 0.7.

TABLE 25
NUMBER OF CONSECUTIVE POSITIONS HELD SINCE GRADUATION BY AGE

Number of Consecutive Positions Held	Age						Total	
	Under 25 Years		25 to 29 Years		30 Years and Over			
	N	%	N	%	N	%	N	%
	1	107	(56.0)	48	(19.8)	34	(14.8)	189
2	61	(31.9)	66	(27.3)	62	(27.0)	189	(28.5)
3	17	(8.9)	67	(27.7)	45	(19.6)	129	(19.5)
4	6	(3.1)	38	(15.7)	43	(18.7)	87	(13.1)
5 or more	0	(0.0)	23	(9.5)	46	(20.0)	69	(10.4)
Total	191	(100)	242	(100)	230	(100)	663*	(100)

* Three hygienists had not held any dental hygiene positions.

TABLE 26
NUMBER OF PERIODS OF UNEMPLOYMENT SINCE GRADUATION BY AGE

Number of Periods of Unemployment	Age						Total	
	Under 25 Years		25 to 29 Years		30 Years and over			
	N	%	N	%	N	%	N	%
	0	171	(89.5)	130	(53.5)	61	(26.3)	362
1	16	(8.4)	82	(33.7)	102	(44.0)	200	(30.0)
2	4	(2.1)	23	(9.5)	49	(21.1)	76	(11.4)
3+	0	(0.0)	8	(3.3)	20	(8.6)	28	(4.2)
Total	191	(100)	243	(100)	232	(100)	666	(100)

5.5 Intentions to Return to Work

Of the 170 respondents who were not employed in December 1974, 99 (58.2%) indicated that they anticipated returning to work as dental hygienists. Of these, 59 (59.6%) anticipated returning to work within one year; and 96 (97.0%) anticipated returning to work within five years. On the other hand, 88 (88.9%), of the 99 respondents who planned to return to work indicated that they would prefer to work on a part-time basis.

Only 16 (9.4%) of the 170 unemployed hygienists indicated that they did not intend to return to work. The remaining 55 (32.4%) were uncertain.

Of the 170 unemployed respondents, 161 (94.7%) were married. Younger hygienists were more likely than older hygienists to express an intention to return to work. (See Table 27.)

TABLE 27
INTENTIONS TO RETURN TO WORK BY AGE

Intentions to Return to Work	Age						Total	
	Under 25		25 to 29		30 and over			
	N	%	N	%	N	%	N	%
Yes	6	(66.7)	46	(68.7)	47	(50.0)	99	(58.2)
Uncertain	3	(33.3)	20	(29.9)	32	(34.0)	55	(32.4)
No	0	(0.0)	1	(1.5)	15	(16.0)	16	(9.4)
Total	9	(100)	67	(100)	94	(100)	170	(100)

5.6 Summary and Discussion

Over one-half of the dental hygienists who participated in the Ontario survey had been employed (either full or part time) continuously from graduation until December 1974; almost nine-tenths had been employed at least 50% of the time. Younger respondents tended to be employed a greater percentage of the time than older respondents.

One-half of the respondents had held only one or two dental hygiene positions since graduation. The mean number of positions held was 2.8. Younger hygienists had held fewer positions than older hygienists.

Ninety-eight respondents reported that they had held two or more (part-time) dental hygiene positions concurrently.

The mean number of periods of unemployment experienced by the dental hygienists in the survey sample was 0.7--over one-half of the respondents had never been unemployed. Of the 304 respondents who had been unemployed for some period of time, 64% had subsequently returned to work.

One-quarter of the respondents were unemployed at the time of the survey. Of these, 58% indicated that they anticipated returning to work as dental hygienists, 32% indicated that they were uncertain as to whether or not they would return to work, and 9% indicated that they did not intend to return to work as dental hygienists. Almost nine-tenths of those who anticipated returning to work were hoping to work on a part-time basis. Younger hygienists were more likely to express an intention to return to work than older hygienists.

From these data it appears that dental hygienists do not change jobs nearly as frequently as has been generally thought. Although a majority of the hygienists who participated in the Ontario survey were relatively young (that is, under 30), even the older hygienists had not

held an inordinate number of different positions. Over one-half of the sample had never been unemployed; of those who had, 64% had returned to work; and of those who were unemployed at the time of the survey, 58% were planning to return to work.

6. CHARACTERISTICS OF POSITIONS HELD AND UNEMPLOYED PERIODS

6.1 Duration of Positions Held

A total of 1,905 positions were held by the 675 respondents who had held at least one dental hygiene position since graduation. Table 28 indicates the duration of positions held: 539 (28.3%) had lasted less than one year (as of December 1974); 579 (30.4%) had lasted between one and two years; 624 (32.8%), between two and five years; and 163 (8.6%), five years or more. The mean duration of positions held was 2.0 years; the median was 1.5 years.³⁷ (See Table 28.)

TABLE 28
DURATION OF POSITIONS HELD

Duration of Positions Held	N	%
Less than 1 Year	539	(28.3)
1 to 1.9 Years	579	(30.4)
2 to 2.9 Years	347	(18.2)
3 to 3.9 Years	163	(8.6)
4 to 4.9 Years	114	(6.0)
5 Years or More	163	(8.6)
Total	1,905	(100)

³⁷ Calculation of the mean and median duration of positions held excluded positions held by the twelve respondents whose employment histories could not be satisfactorily reconstructed. (See Footnote 36.) Some positions were still ongoing as of December 1974 while others had already been terminated. Interestingly, there was no difference in the mean or median duration of ongoing and terminated positions.

6.2 Weeks of Work Per Year Required for Positions Held

Table 29 shows the number of weeks of work per year (excluding paid holidays) required for the 1,905 dental hygiene positions held by the respondents. The mean number of weeks of work required was 47.2. Most frequently, dental hygiene positions involved 48 weeks of work (30.9% of all positions), or 50 weeks of work (28.3% of all positions).

6.3 Hours of Work Per Week Required for Positions Held

Over one-half (N=1,018, 53.4%) of the 1,905 dental hygiene positions held by the hygienists who responded to the survey involved 35 or more hours of work per week; 284 (14.9%) involved 25 to 34 hours; 323 (17.0%), 15 to 24 hours; and 280 (14.7%), one to 14 hours. The mean number of hours of work required per week was 29.5.

From the data it appears that almost one-half of the positions held were part-time positions, that is, less than 35 hours per week. Data presented earlier (see Section 5.3) suggest that hygienists who wish to work more hours sometimes work at two or more part-time positions concurrently. No information was collected which could indicate whether hygienists working at one or more part-time positions were doing so by choice or because full-time positions were not available. Such information would be important to dental manpower planners.

6.4 Location of Positions Held

Four-fifths (N=1,526, 80.1%) of all dental hygiene positions held by the respondents were located in the province of Ontario; 272 (14.3%) were located elsewhere in Canada; 88 (4.6%) in the U.S.; and 19 (1.0%) in other parts of the world. (See Table 30.)

TABLE 29
WEEKS OF WORK PER YEAR REQUIRED FOR POSITIONS HELD

Weeks of Work Per Year	N	%
Less than 40	89	(4.7)
40	87	(4.6)
41	8	(0.4)
42	32	(1.7)
43	9	(0.5)
44	48	(2.5)
45	81	(4.3)
46	61	(3.2)
47	51	(2.7)
48	588	(30.9)
49	224	(11.8)
50	540	(28.3)
51	15	(0.8)
52	72	(3.8)
Total	1,905	(100)

TABLE 30
LOCATION OF POSITIONS HELD

Location of Positions Held	N	%
Ontario	1,526	(80.1)
Newfoundland	6	(0.3)
Prince Edward Island	7	(0.4)
Nova Scotia	33	(1.7)
New Brunswick	7	(0.4)
Quebec	30	(1.6)
Manitoba	35	(1.8)
Saskatchewan	24	(1.3)
Alberta	43	(2.3)
British Columbia	85	(4.5)
Yukon & Northwest Territories	2	(0.1)
U. S. A.	88	(4.6)
Other	19	(1.0)
Total	1,905	100

6.5 Type of Practice

Over three-quarters (N=1,458, 76.5%) of all positions held by the respondents were in private practice--1,051 (55.2%) were in private general practice. Other positions were in public health (N=318, 16.7%); dental auxiliary education (N=103, 5.4%); and hospitals (N=26, 1.4%). Table 31 indicates that there have been changes in the proportion of positions falling into each of these categories over time. Most notably, the proportion of positions in private general practice has increased while the proportion in public health has decreased. Of all positions commencing prior to 1965, 42.7% were in private general practice compared to 51.8% of positions commencing between 1965 and 1969, and 60.1% of those commencing between 1970 and December 1974. In the same periods the percentage of positions in public health declined from 26.6% to 21.4% to 11.8%.

6.6 Duration of Unemployed Periods

A total of 452 different periods of unemployment were experienced by the 313 respondents who were not employed continuously from graduation until December 1974. Over one-third (N=162, 35.8%) of these periods of unemployment had lasted less than one year (as of December 1974); 92 (20.4%) had lasted between one and two years; 116 (25.7%) had lasted between two and five years; and 82 (18.1%) had lasted five years or more. (See Table 32.) The mean duration of unemployed periods was 3.0 years; the median was 1.5 years.

As of December 1974, 170 hygienists were unemployed and therefore their current period of unemployment had not ended. Dividing unemployed periods into those that had been terminated (N=274) and those that were continuing (N=170), it was observed that continuing periods tended to be

TABLE 31
CHANGES OVER TIME IN THE NUMBER AND PERCENTAGE OF
DENTAL HYGIENE POSITIONS DEVOTED TO DIFFERENT TYPES OF PRACTICE

Type of Practice	Period Employment Commenced						Total	
	Prior to 1965		1965 to 1969		1970 to 1974			
	N	%	N	%	N	%	N	%
Private	172	(64.4)	406	(71.7)	880	(82.1)	1,458	(76.5)
General	114	(42.7)	293	(51.8)	644	(60.1)	1,051	(55.2)
Combination (Gen. & Spec.)	22	(8.2)	54	(9.5)	111	(10.4)	187	(9.8)
Speciality								
Periodontics	15	(5.6)	29	(5.1)	54	(5.0)	98	(5.1)
Paedodontics	12	(4.5)	9	(1.6)	36	(3.4)	57	(3.0)
Orthodontics	6	(2.2)	18	(3.2)	21	(2.0)	45	(2.4)
Other	3	(1.1)	3	(0.5)	14	(1.3)	20	(1.0)
Public Health	71	(26.6)	121	(21.4)	126	(11.8)	318	(16.7)
Dental Auxiliary Education	21	(7.9)	26	(4.6)	56	(5.2)	103	(5.4)
Hospital	3	(1.1)	13	(2.3)	10	(0.9)	26	(1.4)
Total	267	(100)	566	(100)	1,072	(100)	1,905	(100)

TABLE 32
DURATION OF UNEMPLOYED PERIODS

Duration of Unemployed Periods	N	%
Less than 1 year	162	(35.8)
1 to 1.9 years	92	(20.4)
2 to 2.9 years	55	(12.2)
3 to 3.9 years	42	(9.3)
4 to 4.9 years	19	(4.2)
5 years or more	82	(18.1)
Total	452	(100)

of longer duration.³⁸ Unemployed periods that had been terminated had lasted a mean of 2.2 years while those that were continuing had lasted a mean of 4.1 years. Medians were 1.1 years for terminated and 2.6 years for continuing periods of unemployment.

6.7 Summary and Discussion

The 678 dental hygienists who participated in the Ontario survey had held a total of 1,905 different dental hygiene positions. Of these, 28% had lasted less than one year (as of December 1974); 30% had lasted between one and two years; 18% had lasted between two and three years; and 23% had lasted three years or more. The mean duration of positions held was 2.0 years.

The dental hygiene positions held by the respondents most frequently involved 48, 49 or 50 weeks of work per year (excluding paid holidays). The mean number of weeks of work required was 47.2.

Over one-half (53%) of the positions held involved 35 or more hours of work per week; 15% involved 25 to 34 hours, 17%, 15 to 24 hours; and 15%, one to 14 hours. The mean number of hours of work required per week was 29.5.

Although 17% of the 678 respondents had moved to Ontario subsequent to completion of their training in dental hygiene, and 17% had moved away from Ontario subsequent to training and/or registering to practise in the province, four-fifths of all dental hygiene positions held by the respondents were located in Ontario.

Over three-quarters (77%) of all positions held by the respondents

³⁸ The unemployed periods experienced by the twelve respondents whose employment histories could not be satisfactorily reconstructed were excluded from these calculations.

were in private practice; 17% were in public health; 5%, in dental auxiliary education; and 1%, in hospitals. Between 1953 and 1974 the proportion of positions in private general practice increased while the proportion of positions in public health declined--43% of those positions commencing prior to 1965 were in private general practice and 27% were in public health compared to 60% and 12% of those positions commencing between 1970 and December 1974.

A total of 452 periods of unemployment had been experienced by the respondents. Over one-third (36%) of these periods had lasted less than one year; 20% had lasted between one and two years; 26% had lasted between two and five years; and 18% had lasted five years or more. The mean duration of unemployed periods was 3.0 years. Unemployed periods that were continuing tended to be longer than periods that had been terminated--continuing periods had lasted a mean of 4.1 years while terminated periods had lasted a mean of only 2.2 years.

Just over one-half (53%) of the dental hygiene positions held by the participants in the Ontario survey involved 35 or more hours of work per week. (On the other hand, just over three-quarters (76%) of the positions involved 48 weeks of work or more per year.) Further research would be required to ascertain to what extent dental hygienists actually prefer part-time employment and to what extent they are forced to accept part-time positions because full-time positions are not available.

A mean duration of 2.0 years per dental hygiene position may appear short to some observers. Two factors should be kept in mind. First, the age distribution of the sample--65% of the respondents were under thirty years of age. Many women in this age category are forced to leave

the work force due to the pressures of housekeeping, child bearing and child care. Second, the dental hygienist's job is not likely to offer much variety as long as she remains in the same position. With hygienists' duties rigidly defined by law and opportunities for advancement limited only a change in position can actually offer anything new to the hygienist.

In the immediate future some of the hygienists who participated in the survey will have the opportunity to undertake up-grading for expanded (restorative) duties thus opening up possibilities for an increased variety of work tasks and new employment opportunities. However, since dental hygienists cannot work independently of dentists, the extent of these developments is very much dependent on dentists' perceptions of the need and demand for more highly skilled hygienists and of the financial advantages involved, as well as their willingness and ability to work in a new form of practice.

7. CONCLUSIONS

The findings of the survey permit some general concluding comments about dental hygienists and the practice of dental hygiene, particularly in Ontario.

Firstly, dental hygienists appear to be a more active group than has been generally realized. Rates of employment were higher (and rates of attrition lower) than expected. There appears to be a tendency for younger graduates to remain in, and older graduates to return to the work force. Unemployed hygienists express a desire to return to work (the majority on a part-time basis).

Approximately one-half of the dental hygiene positions held could be characterized as part-time positions. Over the years there has been a shift in the type of positions held by dental hygienists--now, relatively more are in private general practice and fewer in public health than previously. The average duration of positions held was not inordinately short, that is, hygienists were not found to change positions as often as might have been expected.

The working careers of dental hygienists reflect a combination of hygienists' preferences and conditions in the dental employment market (dentists' attitudes, public demands for dental care, availability of positions, salaries, prescribed scope of activities, etc.). While both preferences and market conditions have undoubtedly changed over the past twenty years, in Ontario even greater and more rapid changes can be expected in the future. More hygienists, who can perform a greater variety of duties, are now being trained annually, while at the same time even greater numbers of preventive dental assistants are being trained to perform duties almost identical to those of the hygienists who participated in the survey. The

effects of these changes are difficult to anticipate. Future research will be required to document the working careers of preventive dental assistants and dental hygienists with expanded duties, and compare them to those of the respondents. Changes in the employment patterns of dental hygienists and the employment activities of preventive dental assistants must be taken into account by dental health manpower planners. Information regarding changes both in the rate of attrition from, and return to, the work force is particularly important for planning purposes.

APPENDIX

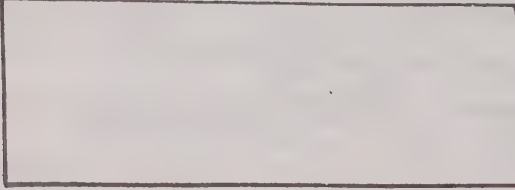
	Page
1. 1975 Dental Hygienists' Licence Application Form	A-1
2. Pretest Questionnaire	A-2
3. Final Questionnaire	A-4
4. Follow-up letter	A-5

The Royal College of Dental Surgeons of Ontario

230 ST. GEORGE STREET, TORONTO, ONTARIO M5R 2N5 - TELEPHONE (416) 961-6555

Registrar - Secretary-Treasurer, KENNETH F. POWNALL, D.D.S.

Assistant-to-the-Registrar, EDWARD J. FOX, D.D.S.



RE: DENTAL HYGIENISTS LICENCE FEE - \$50.00 - DUE JANUARY 1ST, 1975.

PLEASE COMPLETE IN FULL AND RETURN THIS STATEMENT WITH YOUR FEES.

MARITAL STATUS:

Single ()

If Married:

Married ()

Husbands Initials _____

Other _____

Maiden Name _____

COMPLETE THIS PORTION IF ADDRESS DIFFERS FROM ABOVE SHOWN.

NAME _____

ADDRESS _____

(Include Postal Code)

TELEPHONE _____
(Residence) (Business)

EDUCATION: Year of Graduation _____ Degree in Dental Hygiene () ()
List all Other Academic Credits - Specify -

EMPLOYMENT: I am employed by (List all Employers)

Numbers of Hours Worked (per Week) _____

Type of Practice _____

If you do not intend to practice in Ontario during 1975 and therefore do not require a licence, please give reason below:

SIGNED _____

01 Are you currently licensed and/or registered as a dental hygienist? 1 ☐ Yes 2 ☐ No
If yes, please specify in which province(s) _____

02 Change of name and/or address (if different from above)	04 Sex: 1 ☐ female 2 ☐ male	05 Date of Birth _____ (month) (year)
---	--	---

(Surname) _____ Given Name) _____ (Street no. & name) city, town, village) _____ (Province or Country) (Postal Code) _____	06 Basic dental hygiene education (check one box only) 1 ☐ Diploma/Certific. 3 ☐ Associate degree 2 ☐ Bachelor's degree 4 ☐ Other
--	---

03 Location of residence (as of Nov.1, 74) _____ (City, town, village) (Prov. or Country)	07 Prov./Country of Graduation Graduated yr. _____ 19__
---	---

08 Marital Status (as of Nov. 1, 1974) (check one box only) 1 ☐ single 2 ☐ married 3 ☐ other (widowed, divorced/separated)	09 Do you have dependent children or other dependents living at home? 1 ☐ Yes 2 ☐ NO If yes, please specify age range(s) 1 ☐ under 5 3 ☐ 13 and over 2 ☐ 5 - 12
---	---

10 Do you have post-basic education? 1 ☐ Yes 2 ☐ No If yes, please indicate below: Bachelor's Degree 1 ☐ in dental hygiene 2 ☐ in other than dental hygiene Master's Degree 3 ☐ in dental hygiene 4 ☐ in other than dental hygiene	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Prov./Country of Graduation</th> <th style="width: 50%;">Year of Graduation</th> </tr> <tr> <td>_____</td> <td>19__</td> </tr> <tr> <td>_____</td> <td>19__</td> </tr> <tr> <td>_____</td> <td>19__</td> </tr> <tr> <td>_____</td> <td>19__</td> </tr> </table>	Prov./Country of Graduation	Year of Graduation	_____	19__	_____	19__	_____	19__	_____	19__
Prov./Country of Graduation	Year of Graduation										
_____	19__										
_____	19__										
_____	19__										
_____	19__										

11 Please indicate number of weeks worked in past 12 months (dental hygiene only)
(include vacation/holidays) _____

THIS SECTION DEALS WITH CURRENT EMPLOYMENT INFORMATION (as of Nov. 1, 1974)

12 CURRENT EMPLOYMENT STATUS EMPLOYED IN DENTAL HYGIENE ON A 1 ☐ Permanent Basis (full- or part-time) 2 ☐ Casual/Seasonal Basis (full- or part-time) Indicate the total number of hours worked per week during the last pay period ending Nov. 1, 1974 (including paid vacation/holidays) _____ (specify) _____	OR 3 ☐ EMPLOYED OTHER THAN DENTAL HYGIENE OR 4 ☐ Not Employed Are you currently seeking employment in dental hygiene: 1 ☐ Yes 2 ☐ No Please indicate last year employed in dental hygiene 19__ OR Never If you responded to selections 3 or 4 above PLEASE END HERE
--	---

13 TYPE OF EMPLOYER (as of Nov. 1, 1974) (check one box only) 1 ☐ general dental practitioner(s) 2 ☐ specialty dental practitioner(s) 3 ☐ both general and specialty practitioners 4 ☐ public health agency 5 ☐ post-secondary educational institution 6 ☐ other	Please indicate the total number of dentists whose patients you care for _____ (specify) _____
--	--

14 Please estimate the percentage of your time devoted to each of the following activities in the position(s) you held on Nov. 1, 1974 (must add to 100%)	Per Cent
1 ☐ clinical services.....	_____
2 ☐ oral health instruction.....	_____
3 ☐ instructor of dental hygiene students or other dental auxiliary students in a university/community college.....	_____
4 ☐ administration.....	_____
5 ☐ dental research.....	_____
6 ☐ consulting services.....	_____
7 ☐ other.....	_____
TOTAL	_____

15 Location of employment as of Nov. 1, 1974 _____ (City, town or village) (Prov./Country)	16 Date commenced present employment: _____ 19__ (month) (year)
--	---

THIS SECTION DEALS WITH PAST EMPLOYMENT INFORMATION

I Please indicate the number of years since graduation that you have

1. been employed as a hygienist _____
2. not been employed as a hygienist _____

(The above figures should total the number of years since your graduation.)

II Please complete a history of your employment by referring to the categories and examples which follow.

EXAMPLE

TIME PERIOD (give most recent first)*	TYPE OF PRACTICE**	NO. OF YRS. (if applicable, use fractions)	AVERAGE NO. HRS./WEEK	AVERAGE NO. WEEKS/YR. (include paid holidays)
1969-74	Combination	4½	35	48
1968	Periodontist	1	30	45

* - a change in any of the variables shown should be recorded as a new time period

- ** - private general
- specialty practice (please indicate type)
 - combination of general and specialty practice
 - public health
 - secondary and post-secondary educational institutions
 - other

YOUR SITUATION

TIME PERIOD (give most recent first)*	TYPE OF PRACTICE**	NO. OF YRS. (if applicable, use fractions)	AVERAGE NO. HRS./WEEK	AVERAGE NO. WEEKS/YR. (include paid holidays)

The Royal College of Dental Surgeons thanks you for your co-operation in completing this section.

THE ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO
in conjunction with
THE DENTAL HEALTH CARE SERVICES RESEARCH UNIT, UNIVERSITY OF TORONTO

In these days of changing dental auxiliary roles and educational programs, it is important to document the work-life and employment activities of dental hygienists. Please take a few minutes of your time to complete this questionnaire and return it in the stamped enclosed envelope. Thank you. We are trying for a 100 percent response.

(Surname)	(Given name)	Marital Status	Date of Birth	First Yr. licenced
(No. & St.)	(City, Town)	Single { } Married { } Other { }	(Mo.) (Year)	in Ontario 19 --
(Prov./Country)	(Postal code)	(Prov/State, Country of Graduation)		(Year) 19 --

- I. Please indicate the number of years since graduation that you have
1. been employed as a hygienist _____
 2. not been employed as a hygienist _____
- (The above figures should total the number of years since your graduation.)
- II. Please complete a history of your employment by referring to the categories and examples which follow.

E X A M P L E

TIME PERIOD (give most recent first)*	TYPE OF PRACTICE**	NO. OF YEARS (if applicable, use fractions)	AVERAGE NO. HRS./WEEK	AVERAGE NO. WEEKS/YR. (not inc. pd. holidays)	PROV./STATE or FOREIGN C'NTRY OF EMPLOYMENT
1969-74	combination	4½	35	48	Ontario
1968	periodontist	1	30	45	Australia

- * - A change in any of the variables shown should be recorded as a new time period
- ** - Private general
- Specialty practice (please indicate type)
 - Combination of general and specialty practice
 - Public health
 - Secondary and post-secondary educational institutions
 - Other

Y O U R S I T U A T I O N

TIME PERIOD (give most recent first)*	TYPE OF PRACTICE**	NO. OF YEARS (if applicable, use fractions)	AVERAGE NO. HRS./WEEK	AVERAGE NO. WEEKS/YR. (not inc. pd. holidays)	PROV./STATE or FOREIGN C'NTRY OF EMPLOYMENT

- III. If you are not presently employed as a hygienist, please complete this section.
1. Do you anticipate returning to work as a hygienist? Yes (), No (), Uncertain ()
 2. If "Yes", (a) when do you expect to return to work? Within _____ years.
 (b) on what basis then, would you prefer to be employed?
 Part-time (), full-time (), other (). Describe

THE ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO
in conjunction with
THE DENTAL HEALTH CARE SERVICES RESEARCH UNIT, UNIVERSITY OF TORONTO

March 17, 1975

Dear Graduate in Dental Hygiene:

It has been approximately two months, give or take a postal strike or two, since we distributed to you a questionnaire which was intended to elicit information pertaining to the employment patterns of dental hygienists. This is important information to have as we head into these confused times of new dental auxiliaries and new definitions of roles for auxiliaries.

Our response to this questionnaire has been excellent to date--about 80%. Our records suggest that you did not complete and return your survey form and we urge you to do so in order to add validity to the results. In case you have misplaced the original form or indeed through some error on our part, did not receive it, another one is enclosed.

Please do take the time to complete, then return it to:

Dental Hygienists' Survey,
Royal College of Dental Surgeons of Ontario,
230 St. George Street,
TORONTO, Ontario
M5R 2N5

Yours sincerely,

Mrs. S. Gilbert
Research Assistant

Dr. D. W. Lewis
Director

Dental Health Care Service Research Unit

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